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PETROLEUM.

PETROLEUM AS FUEL.

From the London Oil Trade Review.

SIR,—I now send you a description of an experiment, with the apparatus, which I call the "Petroleum Grate." A cylindrical egg-end boiler, which had been standing unused since the close of the Russian war, was offered me, and anxious to learn all the faults of my grate before it left my hands to be operated upon by others, sure to be very severe examiners, I availed myself of the offer. The boiler was one that required a good consumption of coal—about 12 cwt. per day; it was of 6-horse power; and with the water cold, required wood, and about 3 cwt. of coals to start it. I removed the front, took out and reversed the grate bars, reinstated nearly the whole of the brickwork which had been broken away, and placed my grate in its proper position, connecting what I shall now call, till I get a better name for them, the flow and return pipes with the boiler. The detailed description given, I trust will fully explain them, premising that the boiler was not at all adapted to my apparatus; it gave too much air space; the flue and draught was too direct, the heat getting away rapidly; and the brickwork was wet; the boiler was in the open yard; a strong north-east wind was blowing, in proof of which one of my workmen's coats placed upon the brickwork was blown off twice. With all these disadvantages the grate raised the steam with an expenditure of two and a half gallons of crude petroleum. When the oil was fully laid on, the temperature of the water rose in the boiler 10° every five minutes. Each gallon of oil took about an hour to burn, but then I admitted it slowly, stopping at times to observe the action of the vapour tube.—This did not work to my satisfaction; the vapour chamber was placed too low in the grate; when the stoker lighted a few shavings beneath it, the vapour burst out in brilliant jets of flame from the vapour tube, and the smoke from the funnel became almost colorless. As soon as the fire from the shavings ceased, the jets went out, and the vapour escaping unburnt caused a waste of oil. The principle of the apparatus was correct, but the grate having been designed under the very mistaken idea that the oil was dangerous to handle, required a little alteration. I shall now place the vapour chamber above the burning surface, and not below it. Four gallons of oil was supplied the grate, and at the close of the experiment one and a half gallon was drawn off; a quantity was left in which I could not remove, but which serves against the next lighting.

It was a fault that so large a quantity as a gallon and a half of oil should be drawn off. It showed the grate, through my fear of the oil, had been over supplied, and waste occasioned. On the whole, I considered the experiment satisfactory. It proved there was not the slightest danger either in burning, boiling, steaming, or vapourising the oil; the vapour tubes only had to be left open, the vapour coming out fired from the grate and burnt the smoke, giving additional heat. The steady or fierce character of the flame was easily regulated by the cock admitting more or less oil, as I thought proper. The feed-pipe, I did not use. In practice the regular passing of cold water through the grate into the boiler would be advantageous.

The oil was the crude Pennsylvanian, kindly supplied me by Messrs. Goddard, Finch & Co. The grate weighed 2 cwt.; it is now at the Manor Iron Works, Chelsea. I have had the vapour-tube altered ready for a fresh experiment.

Now, under all the disadvantages I first described, my grate was able to raise steam with an expenditure of 2½ gallons of oil. The boiler was not filled with water up to the top of the flue, yet both my engineer and stoker, first class experienced men, said that one sack of coals containing 2 cwt., besides wood for first lighting, would have been required to have done the same. I believe 3 gallons of oil might be safely put against the 2 cwt. of coals as their equivalent; but unwilling to take any test of my own as granted, I will say 4 gallons. My experiment, therefore, proves that 35½ gallons of oil are equal to 2000 lbs. of coal, 40 gallons to a ton, and one ton of the oil itself fully equal as steam producing fuel to five tons of coals.

The small size of my grate, suitable only for a four or six horse power engine, is very much against it. If it formed part of the boiler itself, and that belonged to a 30-horse power engine, it might be so simplified in construction as to be far more powerful.

The commercial value of petroleum as steam fuel I trust will now be considered. Previous to this experiment, I had tried at the Manor Iron Foundry a zinc grate of 24 inches superficial surface, under a small two gallon copper boiler, intended to have been worked with ten jets of gas. The refined oil was used; the flame filled the space under the boiler as well as the chimney, which was two feet in height; the evaporation of the water took place so quickly that it convinced me and the foreman of the works of the power of the oil.

In stowage petroleum occupies less space than coal; it saves about 25 per cent. Without, however, taking this into consideration, if one ton of petroleum equals five tons of coal, the whole of the 10,000 tons of coal of the Great Eastern could have been represented by 2000 tons of oil; the 1400 tons of the Persia and the Adriatic by 280 tons. In every 100 tons of coal a saving could be effected of 80 tons for freight space, and with this at the value of £7 per ton, and the ships relieved of the black array of stokers and coal passers, the amount of profit of pteroleum over coal can be easily estimated. One thing it will certainly do, when our engineers perceive it: it will stop all coal leaving this country for navigating purposes.

In Great Britain, where in many parts good coal can be obtained at 9s. 6d per ton, it is unreasonable to suppose that engineers will immediately reject coal for petroleum, even if it was allowed that the latter was infinitely more suited for steam fuel than coal. In France where they pay £2 per ton for bad Belgian coal, the case may be different.

The use of petroleum in America as steam fuel will enable American ship capitalists to withstand the competition, or knock down, of foreign subsidies being given to navigating companies, their opponents—unless, indeed, it will relieve all Governments from making any subsidies at all.

As to the price of petroleum, my grate burns with equal facility all the hydrocarbon oils. I imagine it will even burn spirits of wine; but of this I am uncertain; it was only the remark of a friend, as an objection to the apparatus. If anything can tend to cheapen the oil, it will be the capability of using it as steam fuel by the Americans themselves; it may make them sufficiently go-ahead as to lessen the expense of transport by improving their roads. Mr. Tait, in his excellent little book, "Petroleum and its Products," tells us that the cost of transit from the oil regions to the shipping ports may be put down as equal to from 300 to 400 per cent., the original value of the oils.

The Pennsylvanian crude petroleum in England, its dearest market, is from £17 to £18 per ton. We have the Wallachian, which can be delivered at Ibraila at £5 per ton, selling here for about £10. There is the Canadian, that Mr. Tait tells us can probably be deodorised at less than a farthing a gallon. For our supply in India we have the Rangoon; for the West Indies the Trinidad and the Barbadoes; we have our own coal oils, the monopoly for which ceased in October last. The Flintshire Oil Company tell us that their oil, only slightly inferior in quality to the celebrated petroleum of Pennsylvania, can be produced with profit at less than one-third the cost delivered in this country, yet they have the conscience to sell it at £10 per ton. We have the heavy petroleum, that, after the spirit and the burning oil has been extracted, this should be much less than £10 per ton; its strength above coal I have not tried.

Petroleum is to be found in Africa, in Greece, in California, and in South America. Our ships have the world before them where to choose, and are certainly not compelled to purchase in the dearest market.

We should hear less of boiler explosions by using petroleum for steam fuel; whenever the water was driven suddenly from the boiler the fire could be instantly put out, and the boiler prevented from getting red hot. The grate when fully supplied with oil, takes one minute to light and less to extinguish. When well warmed it can be lit and put out several times in a minute. Mechanical means could be easily applied to shut up the apparatus without opening the furnace door—the vapour tubes being left to burn out.

As regards the dangerous character of the oil, there must be some grand mistake or misconception. I have used all the oils named, to the heaviest; have mixed and well stirred in a portion of the inflammable spirit to make them more fluid, and burnt them all leisurely in tin and zinc models with perfect impunity, except so far as to succeed in destroying a few of the models. Even the vapour when it escaped appeared harmless: it often went up the chimney by the side of the flame without catching fire, and lit only when a lighted taper was held to it. But when the model had been burning half an hour, the vapour, highly heated, inflamed of itself, and was then difficult to extinguish. It will be seen I burn the vapour in two different ways.

I believe that in places where petroleum is stored any vapour from it could be conducted by a pipe to a furnace, and be there burnt to advantage, or it could be used for lighting instead of gas.

Petroleum could be easily placed on board ship in tight iron vessels, or in the patent metallic casks; the oil supplied to the furnace without being exposed, and there burnt without smell and in perfect safety, it can be made a valuable servant, and only become master through our own mismanagement.

I am, &c., C. J. RICHARDSON.

COAL OIL.

ITS EARLY HISTORY.

The new and extensive manufacture of oils from coal and other bituminous substances, is one of the latest applications of that valuable mineral to new and important uses; and though in its rudest infancy, it promises to become one of the most enlarged and valuable applications to which coal has been subjected.

When the number of products derivable from the destructive distillation of coal at low temperatures is taken into account, the many and varied uses to which each and all of these are capable of being adapted, the cheapness of production, and the unlimited capability of supply, we are tempted to believe that this last effort to further utilize an already inconceivably useful mineral, is the happiest modern result of the application of chemistry to the arts of life.

The discovery of the production of oils from coal, appears to date as far back as the time of Boyle, when the experiments of Dr. Clayton were made upon the inflammable nature of the distillates of coal. They were first communicated to the public by the Royal Society of London, many years after, in 1739: "first (says he) there came over a flegm, then a black oil, and then likewise a spirit (gas) arose, which I could in no wise condense." This gas was such a matter of novelty and interest, that the appearance or nature of the oil was overlooked, and Clayton's experiments, were wholly directed to the examination of the gas, and not of the finid products.

Dr. Hales, in his Vegetable Statics, published in 1726, describing experiments conducted by him, mentions the productions of a volatile oil, which he condensed in a vessel attached to the still.

Dr. Watson, Bishop of Llandaff, also describes the the production of oils whenever coal is heated to redness in close vessels.

Mr. Northern, of Leeds, England, in the year 1805, called public attention to the use of coal gas, and in the Monthly Magazine for April, 1805 writes: "I distilled, in a retort, 50 ounces of pit coal in a red heat, which gave six ounces of a liquid matter covered with oil more or less fluid as the heat was increased or diminished; about 26 ounces of cinder remained in the retort; the rest came over in the form of air as it was collected in the pneumatic apparatus.—In the receiver I found a fluid of an acid taste, with a great quantity of oil, at the bottom a substance resembling tar."

This assaye contains the germ or basis of the manufacture of Volatile Oils from Coal, which was not further pursued until nearly the middle of the present century, when the demand for rapid solvents of Caoutchouc became so urgent, that new modes of obtaining benzule led to the distillation of tar for that purpose, and while separatingbenzule by fractional distillation, other valuable luminiferous agents were found to be present, or capable of being derived from the same crude fluid.

Before the application of coals to the manufacture of gas, the necessity which existed for the use of tar for various purposes by the English navy and mercantile marine, led to the carbonization of coals for the obtaining of tar therefrom; and though generally esteemed inferior for these purposes to wood tar, yet the scarcity of forests, and consequent high price of the latter, led to a ready market for coal tar. The subse quent extended manufacture of gas, not only in England, but throughout the world, led to a large supply of tar, independent of its separate manufacture. The manufacture of coke in ovens led also to a smaller additional supply.

Laurent and Peichenbach had shown the results yielded by the distillation of tars, and Selligue in France applied this knowledge to the practical treatment of the bituminous schists of Autun, and, still later, to the paper coal and bituminous slate of the coal formation.

Selligue purified the oils so as to make burning fluids of them, and was the true introducer of that industry into France. Mansfield, at the close of 1847, obtained his patent for the separation and purification of volatile liquids from tar; the benzule which he introduced into the English market, at once commanded a ready sale, from its known property of dissolving caoutchouc. Before the mastication of rubber was practiced, its solution was the only known mode of separating its particles and enabling sheet rubber to be made; and as turpentine acted but slowly as a solvent, benzule was esteemed a valuable addition to the arts. Mansfield had pointed out its property of rendering air or gases luminous when saturated with its vapor, and naphthalized gas, as it was termed, became an article in domestic use. The other fluids did not make their way into the market as burning fluids, whether owing to their small production or not is difficult to say. This was the position of matters in 1848 and up to 1850.

About this time, James Young obtained a Scotch patent, and subsequently an English one, for the obtaining of paraffin oils from coal; the practical results of his process were so promising that the treatment of coals for the obtaining the distilled oils has every year increased in importance.

This discovery of Young's was one of a class very common in the history of technological improvement: not one in which the improvement has been of that character to astonish by its novelty, or excite admiration by its magnitude; but, on the other hand, a small step in advance of previous applied knowledge, an advance so slight as hardly to have elicited any surprise at the time of publication.

Many years before 1848, it had been known that bituminous schists afforded, on destructive distillation, considerable quantities of oil, and, efforts were not wanting both in France and England to turn these shales to practical advantage.

The experiments of the Hon. Robert Boyle upon coal, by which he obtained a gas, were the first efforts to separate an illuminating agent from that mineral; his attempts were not repeated, and his discoveries lay without any practical result for exactly 100 years, when Mr. Murdock of Cornwall, England, lighted up his house at Redruth with illuminating gas.

On the continent of Europe, the high price of animal oils and fats, and the insufficient supply of vegetable fat oils, directed attention to the distillation of asphalt, bitumens, and bituminous schists, so as to obtain oils for illumination therefrom.

The manufacture of bituminous oils, so extensively carried out in Germany and France for the last 15 years, is of comparatively recent growth in Great Britain and this country, where the pursuit of whale fishing supplied the market with abundance of lamp oils.

It was not, therefore, by tentative essays upon coal or its crude tar alone, that the production of volatile oils was wholly perfected. From the time when Lavoisier had opened up the new and exact mode of examining material substances, the bitumens of Europe had engaged the attention of chemists. Theodore de Saussure distilled the asphaltic limestone of Travers, Neufahatel (Switzerland,) in 1819 and 1820; he obtained an oil therefrom, and found it identical with that from the Petroleum of Amiano. Reichenbach, the proprietor of the chemical works of Tubiricof Moravia, while examining the results of the dry distilla tion of beech wood, in 1829 and 1830, discovered paraffine; he derived it from the tar of the wood. It was found in a few years that paraffine also existed in the tarry matters distilled from other species of wood, and also in the tars arising from the distillation of bitumens, and ultimately in coal. In 1830 31, Reichenback discovered naphthalin; in 1831-32, he described kreosote, piccamar, and pittakal, all of which were derived from the tar obtained by the dry distillation of woody matters.

To no one are we so much indebted for opening up true views of the results of close distillation of organic (vegetable) substances, as to Reichenbach. His name will ever be coupled with the early history of the production of oils from bituminous matters; and it must be acknowledged that for many years all our information on this subject was derived from his researches. In 1833 and 1834, he turned his attention to the distillation of coal in close vessels in contact with water, but without any practical results; from 220 pounds of coal, he only obtained a little more than 9 ounces of volatile oil, or about three-tenths of one per cent. In 1833, Dr. Bley distilled brown coal, and obtained a small quantity of volatile oil, besides some ammoniacal products.

The difficulty in adjusting the due degree of heat, no doubt led to the discouraging results (viewed in a practical light) of the distillation of coals and bitumens; and the extensive use of these materials in the production of gas, drew away the attention of the chemist and the manufacturer from the problem of obtaining liquid products instead of permanent gases.

Still, however, various attempts were made to improve the apparatus for distilling; and the retort of Hompesch, and Beslay, and Rouen, of Gengembre, and others, show that from 1841, correct views as to the means for distilling, for separating the products, and for adjusting the temperature, had commenced to be entertained, although these views were not carried out by treatment always appropriate or successful.

In September, 1812, Mr. Lewitte breveted an apparatus for extracting tar from coal, the object being the application of the tar to varnishes, and modes of protecting surfaces; two circular furnaces, placed at each end of the apparatus, with fan or blasts to activate the fires; the condensing apparatus between the furnaces, consists of a series of narrow passages in brick-work, with a reservoir placed in the centre and front of the apparatus to receive the bitumen. The mode of operation was, to place 3 1-2 tons of coal in one furnace, and the communication with the other furnace, shut off by a register, the coals being kindled by lighting some kindling placed below the coal on the hearth, and opening the blasts, in two hours the combustion becomes active, and tne tar commences to distil over. Combustion lasts 24 hours, and when over, the register of that furnace is shut, and the opposite one lighted, and thus the condensers may be kept in constant use by alternate fires. Coal afforded 10 per cent. of tar by this mode of distillation; the residual coke was valuable for forges and iron furnace operations.

In 1824, Prosper and Charles Chervau breveted a process for extracting by distillation the bitumen which the rocks in the department of Saone and Loire contain abundantly. The mode of treatment was to place the rock, broken into small pieces, into cylindrical cast iron retorts, 5 feet 2 inches long, 20 inches broad, and about 1 1-4 inch thick; this cylinder is closed at one end by the luted cap or lid in the usual way, and at the other the lid has an opening in its centre for the admission of the eduction tube, which passes into a receiver, or wolf's bottle; in connection with this, nine other receivers are attached. The vessels are of stone ware, and so arranged by connecting pipes, that when the first receiver is half full, a pipe leads off the tar into the second, and so on until the last receiver is filled, when it is drawn off by a faucet. The retort is placed on a furnace, whose wall supports it at either end, leaving the centre of the retort free for the flame to play on. The receiving vessels may be emptied by a syphon when the distillation is finished.

The bitumen obtained had all the character of naphtha, and the manufactures recommend it as well suited for giving light in alcohol lamps; they also state that by operating on the rock of Saone and Loire they have extracted volatile oils in the proportion of 40 parts of oil to 100 parts of rock.

Many impediments presented themselves in the practical manufacture of products from the dry distillation of wood and coal. Reichenbach had shown the mode of preparation of oils from vegetable matters, (fresh), from tarry matters, and finally from the carbonizing of pit coal, but the products were always trifling, and therefore even the establishment of modern factories was neither profitable nor inviting. "So remained paraffine until this hour, a beautiful item in the collection of chemical preparations, but it has

never escaped from the rooms of the scientific man."—Thus wrote Reichenbach of it in 1854.—Only since the year 1850 has the manufacture of paraffine from pit coal, turf, and bituminous shales, succeeded as an art. The first manufacture was that of James Young, in Manchester, by whose process, from 100 parts of cannel coal, 40 per cent. of oil and 10 per cent. of paraffine could be obtained.

In thus showing that the practical manufacture of oils from coal is due to James Young, it may not be amiss to call attention to what it was which he produced from coals by distillation. He claimed the production of prraffine oils—not the production of naptha or benzule, nor naphthalin, but paraffine and its congeners; this involves the slower distillation of coals at a lower temperature than had been hitherto effected, and this novelty in practice was followed by the novel result of a copious production of isomeric liquid hydrocarbons; so that really two great results were first demonstrated practically by the operation of Young's process, namely—1st. That coal was a material from which liquids could be manufactured economically, as tar, bitumens, and schists, had been hitherto employed; and 2d. That the liquids so formed were paraffine—containing compounds.

An impression has taken hold of the American manufacturing public, that the patent of James Young has no force, as it was not a new invention at the date of the patent; and from the unfavorable effect of that patent upon the actual manufacture of coal oils in this country an ill feeling has been produced against it. That the owners of this patent had not acted wisely by withholding sales and licenses under it until very lately, is to be regretted; but that it was a bonafide improvement in an art at the time when it was patented, and that, therefore, the patent was rightly issued in this country, there can be no shadow of doubt in the mind of any one who carefully traces the steps of the discovery of the production of photogenic oils from different materials.

Chemists at the present day look upon the fluid bitumen from native sources, and the bitumen existing ready formed into coal, as substances which, if not identical, are very closely allied, so closely that both, when treated alike, yield products closely resembling each other. But chemists and naturalists did not always hold this opinion, and it was by no means a certainly ascertained fact, that the substances treated alike would yield like results; in fact, the term bitumen applied to native plastic liquids and to the material in coal so named, conveyed not the same idea, but merely a remote resemblance; it was a resemblance of physical rather than of chemical properties, and hence the fact propounded by Reichenbach, and practically demonstrated by Young, that bituminous coal on distillation yielded paraffine oils, was a considerable step in advance both in chemistry and manufacture.

In Germany there originated, in 1855, paraffine works at Beul near Bonn, Ludwigshafen, and Toplitz. A few years has sufficed to introduce this wax ymatter into many uses about us. This is shown in the more numerous modes, and the lower prices which it is now obtained.

The manufacture thus established in Germany, was also founded in France and Austria by Selligue, and the success resulting called the attention of England and this country to it as a branch of manufacture.

The first manufacture in this country was the attempt of Solomon Gesner on the bituminous shales of Dorchester, New Brunswick. Extensive manufactories are now established at Brooklyn, New York, Pittsburg, Baltimore, and at several places along the Ohio valley and river. Yet the demand is so much in advance of the supply, that not only is the quantity produced insufficient, but the oil is sent into the market in such a a crude and impure state, that much of the tar is retained, and the oil smokes and gives off unpleasant odors in the apartments.

This manufacture once established must always progress; the oils are valuable as solvents and as lubricators, as well as for photogenic purposes; in the latter use, they give ceteris parabus a whiter and a more brilliant light than any fixed or fat oil, and are produced at much less cost than oil can be had for. Hence, while they narrow the demand for fish and lard oils, which they superseed, and thus prevent the cost of such oil rising to any unusual price, they are themselves controlled by the price of oil; and it only requires sufficient attention to be bestowed upon its purification so as to free it from creosote impurities to render it one of the most pleasing and brilliant, as well as the most economic source of light in those situations where gas is not desirable or attainable.—*Oil Springs Chronicle.*

THE MOISTURE ON A LAMP CHIMNEY.

Probably most of our readers who use petroleum lamps, have observed that when the lamp is first lighted the lustre of the chimney is dimmed, and the flame is obscure y seen with the outlines not sharply defined. In a minute or two the dimness disappears, and the glass presents its usual clear and transparent appearance. This phenomenon is doubtless produced by the deposit of water upon the inner surface of the chimney. Petroleum is composed of hydrogen and carbon, and both of the elements in burning, combine with the oxygen of the atmosphere—the carbon combining with oxygen to form carbonic acid, and the hydrogen combining with oxygen to form water. Both on their first production are in the gaseous form, and the carbonic acid being incondensable, except under very great pressure, passes off as an invisible gas; but the water, though at first in the form of steam, requires to be cooled only down to be condensed into the liquid form. As it comes in contact with the cold walls of the chimney it is cooled to this point, when it deposits itself as a fine dew over the inner surface of the glass. This water, being very pure, transmits light more freely than the glass, but being deposited in hemispherical drops, the curved surfaces so refract the rays of light from their straight tracks, as to prevent the formation of a clearly-defined image in the eye. The thin film or dew, though translucent, is not transparent. So soon as the heat of the flame raises the temperature of the chimney the water is re evaporated, and passes off as invisible steam, leaving the glass transparent as before.

MINING.

THE DUBUQUE LEAD REGION.

EXTENT OF THE LEAD REGION.

The northwestern lead region embraces a section of country some sixty miles in diameter, of which about one half is in Wisconsin and the remainder in Illinois and Iowa, being about equally distributed in each. The Mississippi river cuts through the southwestern portion of the region, and is generally about two hundred feet below the average surface of the lead bearing country. That portion of the lead region which it is proposed to describe is known as the Dubuque district, and includes an area which is some sixty miles in length by some seven to ten miles in width. It is not to be supposed that ore may be found everywhere within this section of country, for the fact is that the richest deposits have been found within some three to five miles of the corporated limits of the city. As the region is explored away from the city in any direction the quantity of mineral grows less, until, at the extreme limits mentioned, it ceases entirely. It may be added that the northwestern district and the Missouri lead mines are the only ones of importance in the United States. Of these two, the former is far the richer, and of its various divisions that known as the Dubuque district is the most valuable in proportion to its extent.

WHEN DISCOVERED.

It is probable that La Sueur, in his voyage up the Mississippi nearly a hundred years ago, discovered the character of this country; but to Julien Dubugue is due the credit of putting these discoveries to a practical use. Little is known about Dubuque save that he is supposed to have first visited the spot that now bears his name, in 1776, and that he did some mining, married a lady of Indian extraction, died and was buried on a high bluff just below the city, where may yet be seen a few stones that are supposed to mark his sepulchre. Not much mining was done, either by Dubuque or his successors, owing to troubles with Indians, until 1833, at which time the Indian title was extinguished. A few settlers were there prior to that time, among whom was James Langworthy, still a hale and hearty resident of a city that has grown complete within his lifetime.

GEOLOGICAL CHARACTERISTICS.

From the surface of the river to the top of the bluffs there are four distinct strata, as follows:—

1. On the surface, a clay soil, varying in depth from eight to twenty feet.

2. Below the clay, slate (shale), whose thickness is from five to thirty feet.

3. Next below the slate, galena limestone—the lead bearing rock—whose thickness is perhaps some two hundred feet.

4. Below the galena limestone, the blue (Trenton) limestone, whose depth is supposed to be from sixty to seventy feet.

These four strata have been brought to light in the explorations of mining. With the last we have nothing to do, as it contains no lead, nor has it any of the features which characterize the lead bearing stratum above it. The latter, with the exception of perhaps its lower one third, is divided by fissures, or "crevices," which run east and west, and are crossed by others which run nearly north and south. The difference between these crevices is marked. Those which run east and west traverse the entire extent of the lead bearing limestone, with a direction so invariable that, when a crevice is once known at any point, the compass will reveal its continuation to a fraction, at any distance either east or west. Those that cross these—called "norths and souths," from their direction—are not uniform in their extent. Some run a short distance and then cease entirely, generally beginning and ending in the "casts and wests." Any other fissures than these two, and they are not numerous, are called "quarterings." When it is added that these fissures descend perpendicularly from the upper surface to the lower surface of the galena limestone, enough has been said to give the general reader an idea of their most marked features.

HOW LEAD IS FOUND.

There are several species, or rather forms, of ore, which are termed by miners "float mineral," "sheet mineral," "cog mineral," and "chunk mineral," and whose names are dependent upon their shape, except in the case of the first, which is so termed from being found at a distance from any body of ore, as in a ravine for instance, having "floated," as it were, there from some deposit.

The operation of digging the lead is very simple. Let us take a case by which we will not only understand the process, but also, as we proceed, get an understanding of the character of the crevices. Supposing that, by survey, accident, or some other cause, a miner finds that a crevice runs beneath a certain spot. Selecting some ravine, or the lowest possible point afforded by the inequalities of the surface, he commences to sink a shaft, which is simply a hole like a well, say four feet by six in diameter. A simple windlass, with rope and bucket, is, of course, necessary; and these, with the necessary implements for digging, are about the stock in trade, save hope and perseverance, that is needed to commence operations as a lead minor.

It may be said at this point, that the operation of discovering an east and west crevice, is very simple, even where its exact locality is not known. Commencing to sink a hole, the minor will labor until he reaches the slate stratum. He then runs a small passage, or drift, directly north or south, until a thin sheet of iron rust is discovered, beneath which the true crevice always lies. This fact known, it is only necessary to take the underground bearings of the locality, return to the surface, measure off so many feet to the north or south, and then commence the sinking of the shaft directly over the fissure.

The labor of sinking through the clay layer is comparatively an easy one. The ground yields readily to the pick and spade, so that the expense and labor of pushing this part of the work is comparatively little. Owing to the soft nature of the clay, and the effect upon it of rains, it is generally necessary for the miner to timber his shaft as he proceeds, to prevent its sides caving in under the pressure of the surrounding earth. The clay is soon passed, and the slate is reached. This is somewhat more difficult than the other, but still offers no serious obstacle. It is very easily broken by gunpowder, and affords little or no resistance to the drill.

Finally the clay and slate are passed, and the limestone is reached, when the real labor of the miner begins. The fissure, or crevice in the rock, is usually at the top closed up; that is, its presence can only be detected by what appears to be a seam running east and west along the surface of the limestone. Sometimes it is open enough so that a knife blade may be thrust down, and at other places the crevice is an inch or so in width, and filled with clay. The operation of running the shaft down from this point is very laborious and tedious. The rock is quite hard, and must be blasted all the way, during which, if the crevice is tight, two men will not progress more than six inches per day. If, however, the crevice is open a few inches, the labor is much lightened, and in that case from two to three feet each day is usually made.

Although shafts through the solid rock are not uncommon, they are only made in case of necessity. In his search for the point to sink, the miner will, if possible, select a point where the east and west crevice is crossed by a quartering, or a north and south, at which junction there is quite frequently what is called a "chimney." This is a well shaped opening of irregular outlines, which extends down through the limestone, and sometimes breaks up through the slate and clay to the surface, forming a large hollow in the ground, which is known as a "sinkhole."

These chimneys very frequently aid materially the progress of the sinking of the shaft. They sometimes widen out so as to render further labor in sinking the shaft unneccessary. At other times they widen out in every direction, forming a cave of greater or less extent. These caves are occasionally of vast dimensions. The one known as the Richmond cave is one hundred yards in diameter, by some fifty to seventy-five feet in height.

HOW CHIMNEYS ARE FORMED.

Crevices often lie in doublets or triplets; that is, two or three, or sometimes more, of them lie comparatively near to each other, forming what is called a "range." The distance between the crevices in a range is from eight to sixteen feet. It sometimes happens that this system of crevices is intersected at some point by "quarterings" and "norths and souths." The obvious effect of several of these fissures meeting at some point is to weaken the rock in the vicinity, which, by the action of water, finally breaks up and falls down, by which an opening, or room, of greater or less extent, is ormed. This is what is known as a "chimney," "pipe" or, when of large dimensions, as a cave.

But let us return to our miner, whom we left pushing his shaft down through the solid limestone. Supposing there is no chimney, this labor is at first severe, but after proceeding a distance of about thirty feet a layer of limestone is reached which is somewhat harder than those above it. Working through this a distance varying from three and a half to seven feet, the crevice suddenly widens out into what is called an "opening." The rock which overlies this opening is called the "cap rock," and, although affording more resistance to the progress of the miner, is always not unwelcome, from the fact that its presence invariably indicates the opening below.

The "openings" are of all possible sizes, from three to twenty feet in width, and from five to twenty-five feet in height. It is in this opening that the ore is found. It sometimes is in the shape of blocks, and is attached to the cap rock; or it may be found covering the walls of the opening in sheets varying from one inch to two feet and a half in thickness: or again, it may be found in "chunks," "blocks," or "cogs," imbedded in the clay which invariably fills the opening.

Once in the opening, the labor of "proving" commences. The clay which fills the opening is hoisted to the surface, and the miner "drifts" east or west as far as the nature of the surroundings will permit. Sometimes an opening may be followed for miles without any labor save removing the soft clay with which it is filled, but frequently sides of the opening approach each other so closely as to form a "bar," by which further progress, without blasting, is rendered impossible. In pursuing his investigations by drifting east and west, the miner crosses "quarterings" and "norths and souths." These are sometimes open, but more generally closed. Sometimes they "carry" a thin sheet of mineral, which is generally followed, as it is likely to lead into a deposit of mineral in some adjacent east and west.

If the miner does not find the opening to contain a lode, or "lead," of mineral, he commences sinking his shaft downwards from the first opening. The same phenomena occur as in passing from the surface of the limestone to the first opening. From twelve to twenty feet below the first opening the crevice widens into a second opening, which is substantially like the other. About the same distance below the second opening the crevice widens into a third opening, below which no investigations have ever been made to any extent. The strongest mineral is invariably found in the first opening. Large quantities of ore are also found in the second; but the third has never yet been found to contain mineral in quantities large enough to pay for the labor of reaching it. In occasional cases a chimney breaks down from the upper surface to the third opening, in which case it sometimes carries mineral with it; but in no case have there been in this opening such deposits as are taken from the openings above.

DIFFICULTIES IN MINING.

In the Dubuque lead region, in those parts where the heaviest lodes have been discovered, it has been found that, soon after passing the cap rock of the first opening, further progress was prevented by water. The height of this water is changeable, ranging over a distance of eight feet. There is not, however, so great a variation in any one year; but it occurs only perhaps during a period of from five to seven years. There is each year a small difference in the height of the water, owing to the seasons. Some three months or so after a very wet time, the water rises somewhat; and, after about the same lapse of time after a dry period, there is an appreciable decline.

The presence of this water has proved thus far a very serious hindrance to successful mining operations. It is very equally diffused over the mining region, although, owing to the peculiar formations of certain portions of the country which permits the passage of water, there are intervals at which no water is found. Such are called dry diggings, and may be worked at any season without hindrance. In the great majority of cases, however, the water has possession of the openings, and can only be removed by artificial means. In a large number of instances, some of the heaviest lodes have been run into the water at the very point where the yield has been of the most lucrative character. In such a case, the general course has been to pump the mine by machinery, either driven by horse or steam power. By this means the general weight of the water in a particular locality has been reduced, thereby allowing the removal of additional ore. But even this method has been found inefficient to reduce the water below a certain point; and, in many cases, some of the richest lodes ever discovered in this region have been abandoned at a point where the mineral was deposited in immense quantities. In the Karrick lode, 7,000,000 pounds have been removed just below the water level. At the very lowest point to which it has been possible to reduce the water by the most powerful machinery, the lode gave no signs of exhaustion, but seemed as plentiful as ever. Numbers of equally remarkable cases could be mentioned where a like result has been obtained, notwithstanding the most strenuous and costly efforts. In some cases the erection of pumping machinery has been a costly failure, and in only occasional instances have results been obtained commensurated with the expense incurred.

These facts having been long well understood, it has been known that some other direction must be given to drainage. To produce any other than a temporary effect by the use of pumps driven by machinery has been found to be not only very costly, but useless. In view of these facts, miners long since concluded that the only effective manner in which the mining region could be drained effectually was by a tunnel, or "level," which started at the foot of the bluff, should run in beneath the deposits of mineral, and thus create a channel for the easy, natural and constant egress of the subterranean water.

THE ADIT LEVEL.

Of course to secure a result so vast, there was but one manner which presented itself to every one who gave the subject consideration. Therefore there is no one who claims the paternity of the idea although the first recorded mention of the subject that we recollect is to be found in the geological surveys made of the lead districts under the direction of the United States government a few years since. Up to the last year the idea of an adit received no more attention than was involved in its mere consideration, from the fact that it was an undertaking which involved the outlay of enormous capital. This fact alone has so long prevented this plan of drainage from securing that attention which it merited.

Last winter, however, the attention of several New York capitalists was invited to the subject. A visit to Dubuque followed, and a little later it resulted that a company, composed of gentlemen from New York and also from Dubuque, was formed, by which the necessary amount of capital was subscribed, as the work was immediately commenced.

The line selected for the running of the level was beneath a crevice, or rather range of crevices, in which frequent explorations had revealed large quantities of mineral, but whose removal had been, to a very large extent, rendered impossible by the omnipresent water. A deep ravine, known as Langworthy Hollow, which makes a deep cut through the bluffs west of the river, ran conveniently near this range, and it was in this, at the distance of about a mile from the banks of the Mississippi, that the first work on the level was begun.—Commencing in the ravine the level pushes directly south for a distance of six hundred feet through the solid rock, at which point the third opening in the main crevice of the range above alluded to is reached, where it turns directly to the west and follows the course of the crevice.

At present the level has been completed for a distance of about twelve hundred feet. When finished it will penetrate the lead region for a distance of something over a mile. The tunnel being run under the lake in Chicago has excited much wonder, as being one of the greatest undertakings of the age. It is truly a great work, but one whose character is not more worthy of admiration than the Dubuqae level. The former runs through clay; the latter is blown out of the solid rock. In constructing the latter, shafts have to be sunk at short intervals from the surface to the level, and all of them, after passing the slate stratum have to be carried through the solid limestone. The first of these shafts is twenty-six feet; the next fifty; the third ninety; the fourth over one hundred feet; while those yet to be built will be deeper still, owing to the rise in ground as it recedes from the river. Some of the shafts yet to be sunk will be nearly, or quite, one hundred and fifty feet in depth, the main portion of which will be through the rock.

The level, as far as completed, is a work of the most substantial character. Its average height is ten feet, and its width about four. Thus far the fissure along which it has been worked has been nearly closed, rendering the progress of the tunnel very slow and its labor extremely severe. It is calculated, that, at the present rate of progress, the time necessary for the completion of the level will be about eighteen months. The entire number of men employed in the work is

about forty, who labor in gangs, and who change once every eight hours, so that the work goes on night and day without intermission.

RICHNESS OF THE LEAD REGION.

The Dubuque region is probably the richest in the world. Below are a few of the amounts taken out by parties from the section of country which it is probable will be drained by the level. These quantities have all been taken from above the water, or from such dry diggings as are discovered at very rare intervals. In a majority of cases, notwithstanding the vast quantities taken out, the lodes, in all their original strength, disappeared below the water:

	POUNDS.
Booth & Carter	3,500,000
Dubuque cave	2,000,000
Ruff & Stout	1,200,000
Ames	2,000,000
Kilbourn	4,000,000
North Langworthy	3,000,000
Slater	2,000,000
Madden	2,000,000
Wooster & Hurd	1,500,000
McKenzie	1,000,000
Steward & Bartlett	4,000,000
Kennedy	1,700,000
Kerrick	5,500,000
Levins, in one lode	3,500,000
Kelly range	10,000,000

At the present time the price of ore is about $75 00 per thousand pounds, from which fact can be obtained a tolerable idea of the enormous value of the lead bearing region. Until within a very few years ore has invariably commanded gold, in which respect the hardy miners have proved themselves a hard money people to an extent that would have afforded delight to Tom Benton in his most determined moods with reference to a specie paying millenium.—*Chicago Times.*

GAS.

NEW YORK, Nov. 26th, 1864.

To the Editor of the American Gas Light Journal;

Sir—You have recently given a place in your columns to a re-print of a pamphlet issued last spring by the Manhattan Gas Company, attacking Water Gas process, generally, and my invention particularly. I send you a copy of my reply to this attack together with a letter from the Superintendent of the Gas works of Elizabeth, N. J. I rely upon your sense of fairness to give these replies a place in your journal.

Respectfully yours,

W. H. GWYNNE.

A REPLY TO SOME PORTIONS OF A PUBLICATION ENTITLED "HISTORY AND VALUE OF WATER GAS PROCESSES."

The Manhattan Gas Company of this City has issued a pamphlet for the enlightenment of the public mind, not being content alone with lighting the public highways. Objections to the street lights are frequently made, on the ground that the light is not what it purports to be, and it will be found that this attempt to provide mental illumination, proceeding as it does from the same source, is open to similar objections. It pretends to be scientific; scientific reports should not be scurrilous. The name of water gas is not the one by which I designate my process. I use anthracite coal to decompose superheated steam in a novel manner, and furnish the necessary supply of hydrogen gas, which is subsequently carbonized. Let me at the outset assure all who feel an interest in my improvements, that this so-called report, though intended to work injury, is, when examined, found to be of very little consequence, as far as it regards my invention. Of the forty two pages composing it, only the first seven relate to my process; and the only portion of these really meriting attention, is the account (pages 4 and 5) of the experiments made on the 16th—19th March; and notwithstanding the bold inaccuracy of this account, it will be seen that it admits the production of about six feet of 15½ candle gas from each pound of coal—a result which is forty per cent. in excess of the ordinary product of gas works throughout the country. It is understood that the production of this pamphlet was undertaken with the view of criticising the zinc gas process known as Dr. Elmer's, and it was an afterthought to combine therewith a report and attack upon the process patented by me and lately brought before the public by The Anthracite Gas Lighting and Heating Company of New York. There is no connection between Dr. Elmer's business and mine, and I need make no further allusion to it.

That portion of the public (of course a great majority) who are not acquainted with the details of gas making, are sought to be prejudiced against my invention, which is to be introduced into competition with this overgrown Company, and the stockholders of the Anthracite Gas Company, and those who may be disposed to become stockholders, are addressed in terms which betray a very great uneasiness on the part of those making the attack, but in a way which is anything but consonant with the facts in the case, and which requires some elucidation. Does this mammoth concern suppose that they can preserve from generation to generation the privileges which they now enjoy, by assailing in such terms as they have seen fit to employ those who have committed no fault, except that of extending an invitation to witness their process, under the supposition that the courtesy shown would meet at least a respectful consideration? Do they think that a resort to misrepresentation and abuse will be profitable to them? Have they such a hold upon the public esteem and gratitude that they can afford to make such attempts upon public credulity? The writer of this confesses that he always strenuously opposed giving any invitation to the Manhattan Company, thoroughly disbelieving in the fairness of the parties; but he was assured that their desire was to seek for the truth and make an honest report, and his objections were overruled; the result is the tissue of misrepresentations and omissions upon which it is his duty to comment. Before entering upon the details of the experiments witnessed by Mr. Schultz, the assistant chemist, Dr. Torrey premises that the patent of Mr. Gwynne will not stand in the way of any one who wishes to make water gas. This may seem all right to the vision of Professors and Officers who live in the employ of the Manhattan Company, but the rest of mankind will probably act upon a different code of morals, and if they do not, they may have reason to regret following Dr. Torrey's counsel. It has been pretty distinctly intimated more than once that this Company will adopt the Gwynne process, and refuse to compensate the patentee; or, in the words which have been reported to us as coming from a very high officer of the Company, "It will be *cheaper* to settle with the owners of the patent right through the courts of law than to buy the right." This is corporate morality, I suppose. But if there are corporations that do not recognise the binding force of the divine statute, "Thou shalt not steal," there are legal modes of reaching the treasury of such as have no conscience. The Rev. Rowland Hill, when at the height of his popularity as a London preacher, drew vast congregations, which afforded great temptations to pickpockets. On one occasion he said, before begining sermon, "I will remind my audience that the eye of God sees everywhere, but as there may be some persons present who are insensible to this consideration, I will mention, for their benefit, that we have a number of Bow street officers present, who will keep a sharp lookout."

In order to enlighten the public (which is so plainly the object of the very disinterested publication), a parade is first made of some partial experiments, which were left unconcluded, mainly on account of low heats and defective new apparatus, which were accidentally in the way. The first bench erected at Elizabeth (they call it the second), and concerning which so much pleasantry is attempted, was defective on account of the partition of the retort being cast with a large hole in it, which was only discovered after it was put into use. It was, hence, entirely unfit for our purposes, and a new one was ordered from the foundry; all of which was perfectly well known, but the fact is suppressed. All the labored allusions to this bench are therefore of no other value than to exhibit the spirit in which the report is made. Another circumstance more glaringly shows the same spirit—Mr. Schultz desired to take a bottle full of the gas for analyzation; but instead of taking it from the holder, whence alone the average quality could be obtained, he attempted to take the gas running very near the end of a charge, when, as every gas maker knows, the good gas has all passed off and the quality runs down to not more than one fourth the average of the whole charge. I considered this proceeding so outrageous, that I interfered, and forbade it in a manner that evidently has not yet been forgiven. I trust this peculiar report has afforded satisfaction for my emphatic denunciations. It is painful to make such exposures, but the parties must abide the consequences of their own acts. We had good reason for believing, at the very begining of the trial on the 15th March, that our invitation was not accepted for the honest purpose with which it was given, but that these scientific investigators were sent to Elizabeth precisely as certain English tourists come to the United States, viz., to gather a few facts, a few names of cities, hotels, railroads &c., and a few figures wherewith to spice and color what was pre-determined to be a *slashing* report.

The statement relating to anthracite coal, though not of much importance, exhibits the prevailing intention. The anthracite charge was drawn at the end of the third day, not because of any impaired quality, but solely for the purpose of weighing what remained, to determine the exact number of pounds used. This was 213 pounds—no more, no less—not 260 pounds nor 300 pounds. The anthracite coal we use, even at $9 per ton, costs us about the enormous sum of three cents per thousand feet of gas.

As to the labor question, the assertion is recklessly made that double the usual labor is required by my process. The facts are these: with exactly the same number of men as have been heretofore employed at the works, our charges, somewhat less in weight, are burned off in *one half the time* required in the old way. *This is called doubling the labor.* On the contrary there will be, in any large works, a very great saving of labor; for if we make a much larger quantity of gas from an equal weight of coal, how can it be otherwise than that there is less shoveling and wheeling of coal? Our improvements, if introduced into the Manhattan Co.'s works, would effect a saving in labor, coal, and wear and tear of apparatus, of many hundreds of thousands of dollars every year; but it is an object with the managers of such companies to preserve the *statu quo*, for reasons which they understand.

The coke question is, perhaps, made the most prominent, and we find it treated in precisely the same way as the others. It is known by all gas engineers that works of small and moderate size consume for fuel about all the coke they make, and instead of selling coke, the small companies frequently purchase additional fuel: and it is certain that as much coke is now saved at Elizabeth as has been heretofore saved while working in the old way. But in large works the conditions are greatly altered. Five retorts instead of three are set in each oven, and heated by one fire; the benches are set in long rows, and back to back, thus saving fifty per cent. of heat. These facts govern the whole coke question, and yet not the slightest allusion is made to them in their very remarkable publication. The pettifogging consists in comparing things that are quite dissimilar. The bench reported upon, contains three small iron retorts, and with the back and sides exposed to loss of heat by radiation, and without either of the immensely important advantages of a setting in fives or of clay retorts, or of exhausters. All these points, which can be fully appreciated only by those who are familiar with gas making, are purposely left out of view in a publication intended for the eyes of the uninitiated. That any comparisons, to be worthy of the name, must be made under condi-

tions somewhat similar, is too plain to be further insisted upon.

The trial made on the 16th—19th March is reported with a disregard of the facts which is truly amazing. There were exactly twenty-four charges, of 250 pounds each (not 25), and as soon as the 24th was drawn, and the weighing and measuring concluded, the men left for New York. The report here contradicts itself. The trial was begun at mid-day on the 16th and ended on the 19th, extending through 72 hours exactly. The average time of each charge, and cleaning out pipes, they state, were three hours. Now, 24 times three make 72—showing that the 25th charge was an imaginary one, to reduce the average yield of gas. Imagination is out of place in scientific reports. The weight of coal used was 6,000 pounds, not 6,250 pounds, as stated; the product was 36,120 feet, not 37,230, as stated; and the average was above six feet to the pound, and not 5 95-100, as stated. The memorandum book of the employee of the Manhattan Co. showed the figures as I here relate them, and the facts are known to dozen other persons. I am at a loss for words to characterize such reports. Would it be believed that malice could commit such an imprudence as is here shown? What value can be attached to any portion of a publication wherein the imagination plays such tricks? How enormous must be the privileges, and how important must be the gains, declared and undeclared, which can prompt the use of such means to preserve them!

A parade is made of sixty notices of what they call water gas patents, and I find that nearly all of these refer not to the use of *coal*, but of air, benzole, naphtha, turpentine, tar, oil, &c., &c., and the few remaining processes are totally different from mine, which I could very easily show, if this were the proper place for doing so. They have analysed the gas taken, but do not report the result. From the little information we can extract on this point, we think the analysis has shown more olefiant gas and less carbonic oxide than exist in some other gas which the public pay for. If the analysis should be published, we trust it will be accompanied with the affidavits of more than one person.

They state we had abondoned low heats, and had the good bench at a strong working heat. Our heats have never for a day exceeded a cherry red, while at the Manhattan Company they are between an orange and write—several hundred degrees higher than ours. The fling about cleaning stand-pipes is frivolous; a slight alteration of the mouth-piece, which is already made, will enable us to clean from below, as the Manhattan Company does. Before the invention of exhausters, did not the Manhattan Company clean their own stand-pipes from above? In many works red hot iron bars are used for this purpose to this day.

The reports of the tests by Photometer give us a sufficiently satisfactory standard, and I will let them pass, merely remarking that the superintendent of the works, who is a disinterested witness, announced a somewhat higher candle power than Schultz's, after each of the calculations made by both. They do not mention that they require five hours for burning off their charges, in place of our two and a half hours; nor that their retorts are set five in a bench, and the benches in long rows and back to back, thus saving enormously the heat and fuel; nor that they use exhausters driven by machinery, which would be too costly for small works; nor that they have clay retorts, whereas we are as yet using iron ones. Not one word of all these matters, and yet they make insinuations about "accidental omissions."

We are told, with a peculiar slur, that they used *our bushel measure*. Now I confess that the great Company knows a great deal more about weights and measures than I do. I merely use the old ones found at the works, and which are supposed to be correct. I would be delighted to tell, if I knew, which measure is larger, that used at Elizabeth or the one that measures the coke sold in West street. We hear a good deal from New York consumers about measurement of gas through meters, and of coke sold by the chaldron; but this world is given to slander, and perhaps there is no truth in what the public say on this head. I know so little about the bushel measure they speak of, that I feel very grateful that they have not reported that it held but half a peck.

Let us examine for a moment the chemical theory concerning the decomposition of water contained in coal. The learned Docter thinks that gas engineers have overlooked certain facts about ammoniacal liquor, and they indite a very pretty paragraph, beginning, "Why should that water which is present in excess in the coal, &c., why should it not be decomposed in the same manner as when passed into a separate retort? &c., &c." Is this ignorance real or assumed? I will not decide so nice a question. The water contained in the coal is driven off in the form of *vapor*, not superheated steam, at the beginning of the operation and before the carbon in the retort has become sufficiently hot to decompose the vapor into combustible gas. Nor do many engineers believe that the water passes off as ammoniacal liquor, for this runs off long after the surplus water is driven from the coal. I would ask the learned Docter, is it not more probable that the ammonical liquor is produced as follows: The nitrogen gas contained in coal and set free by heat, unites with a portion of hydrogen, forming ammoniacal gas, not liquor. It does not assume the liquid condition until the gas is absorbed by the water used for washing. If the Docter's theory is correct, why use washers or condensers in gas works? If the ammoniacal liquor is only water, as the learned Docter says, why not collect it in the liquid form?

We are informed, in conclusion, that this great Company (which of course knows the best methods) has made 12,000 feet of 15 candle gas from a ton of American coal. Why do they not continue to do it? They only lay claim to a product of 9,500 feet per ton, or 4¼ feet per pound. There is a good deal said about their 18 candle and 16 candle gas—my private opinion is that the less they say to New Yorkers about this the better. As to the heating gas, which is going to explode and probably kill somebody, every intelligent school boy knows that all ordinary illuminating gas is explosive, if mixed in certain proportions with atmospheric air; and if I remember rightly, the history of the Manhattan Company has furnished some unfortunate illustrations of this fact, and we occasionally find accounts in the newspapers of such explosions. Gas stoves may easily be arranged so as to render explosions simply impossible. The principle is found in Davy's mining lamp, which all learned doctors understand quite as well as I do; but it is apparent that when the vision is directed through the huge street mains and pipes which rival companies are preparing to lay down, and which excited fears "body forth" as present realities, the vision is somewhat perverted, and there arises a phantasmagoria of explosive gas, diminished dividends, small bushel measurer, figures disarranged in the memorandum books, &c., &c.

Notwithstanding the attack which has been so unscrupulously made, it remains true that we make gas satisfactorily with lower heats than our detractors ever attempt to use, and with inferior apparatus; that with good heats we make from twenty-five to fifty per cent. more gas from the same weight of coal; that with clay retorts (some of which we are now preparing) we shall save of the tar waste, instead of making 10 to 15 gallons (Manhattan measure); that we shall still further diminish the time of the operation, and still further increase the yield of gas.

The end is not yet. I have been overpersuaded to exhibit to certain courteous and fair-minded parties some real improvements, which have made them very uneasy. The same parties are destined to witness hereafter what will still more affect their equanimity.

For the information of the public, I may as well say here that the Anthracite Gas Lighting and Heating Company intend that the price of gas in New York shall be reduced, for the working of my process on an ample business scale for more than two years, has demonstrated its capability to furnish gas of a superior quality at a greatly reduced rate; and when this Company shall have erected works of the magnitude of those of the Manhattan Company, the coke and the dividend questions will no doubt be resolved to the satisfaction of the stockholders.

New York, May 4, 1864. WM. H. GWYNNE.

THE NEW HYDRO-CARBON LIGHT.

Artificial light is obtained from white-hot carbon within a flame, and the amount of light depends:—I. Upon the quantity of carbon present: and II. Upon the temperature to which the carbon is raised. Common gas is very rich in heating materials, but poor in the highly carburetted bodies which afford light; hence, while its heat is great, its light is feeble. Nearly 90 in every hundred feet of common gas consists of heating constituents, which do not afford light: viz., hydrogen, marsh gas, and carbonic oxide.

If, before this poor gas is burnt, a quantity of a body rich in carbon, such as naphthalin or carbolene, be added to the gas, the light is enormously increased; the increase varying in proportion to the quantity of carbon so added, provided it be not in such excess as to cause smoke.

The apparatus for this purpose known as "Bowditch's Patent," consists of a gas-tight metallic box into which are soldered two gas pipes, one for conveying gas and vapour out of the box to the burner. The burner is fixed to the outlet pipe, and so placed that when gas is being burnt, the hot air from the gas-flame must impinge upon the box. The box is provided with a screw-plug through which the hydro carbon is put into it, and this plug is closed during use. The box being supplied with hydro-carbon is connected with any ordinary gas-fitting and the gas is lighted. At first, the gas passes over the surface of the hydro-carbon without being effected, but when the temperature has risen sufficiently to convert the hydro-carbon into vapour, the passing gas carries with it a quantity of the vapour, and the flame becomes highly illuminating, the illumination being proportional to the quantity of vapour present in the flame.

Owing to the extreme richness in carbon of naphthalin (the proportion of carbon to hydrogen being as 120 to 8) the quantity which can be burnt perfectly is small. Not more than 35 grains can be burnt with each foot of ordinary gas, and to consume this quantity it is necessary to use fine burners, such as No. 2 cannel. The apparatus, too, must be so constructed that not more than the proper quantity of naphtalin be volatilized, and this is secured by placing the flame 7 or 8 inches below the box, and burning from 1½ to 3 feet of gas through a cannel burner. If larger flames be desired, a shield must be placed between the box and the light, so as to ward of the heat, or the distance between the light and the box must be increased.

In the following experiment naphthalin was used, and three feet of gas per hour was burnt through two cannel burners, attached to an apparatus of the Gas Carburetting Company. The naphthalin consumed was 31·5 grains per hour, as ascertained by an accurate balance; and the light given by the two flames was equal to 22·5 sperm candles, measured by a Bunsen's Photometer. The gas employed in this experiment, consumed in a flat-flamed burner, would not give more than the light of 1·5 candles per foot, whereas by adding to it 31·5 grains of naphthalin, the illuminating power was raised to 7·5 candles per foot: or, to express the result in another manner, an addition to gas of a seventh of its weight of naphthalin increased the illuminating power five-fold.

In London, 1000 feet of gas costs 4s. 6d., and as burnt in flat-flame burners, gives the light of 1500 candles. An addition to this of 4½ lbs. of carbolene (costing about 9d.) raises its light to that of 7500 candles. In other words, 5000 feet of common gas give the light of 7500 candles, at a cost of £1 2s. 6d.,—whereas the same light may be obtained from 1000 feet of carburetted gas at a cost of 5s. 3d., being a saving of 17s. 3d. upon each 5000 feet of gas.

Another experiment may be mentioned as illustrating the economy of the new process, when applied to public lights. It was made by Mr. Thresh, Gas In-

spector of the Corporation of Wakefield, the gas being accurately measured and the hydro-carbon weighed. The experiment was made in a large lamp in Westgate, opposite the Post office. The lamp has a meter fixed in the base of the column to measure the gas, and contains two lights, which burnt 98 hours per week during the experiment. From December 6th to 12th (seven days) an apparatus of the Gas Carburetting Company was issued, and the gas burnt through it amounted to 570 feet, equal to 2·9 feet per hour consumed by each burner. The hydro-carbon burnt weighed 1¼ lb. From December 13th to December 20th (seven days) two ordinary burners were substituted for the apparatus, and the gas consumed was 1050 feet, equal 5·3 feet per hour consumed by each burner, showing a saving of 480 feet of gas in a single week, in one lamp: the light with the larger consumption of gas being less than half that obtained from the smaller consumption of gas aided by the hydro-carbon.

Expressed in candles, the light from
Dec. 6th to Dec. 12th (7 days), would be 570 + 5..... .....2850 candles.
From Dec. 12th to Dec. 20th (7 days)* 1050 "

Gain in light.....1800

Expressed in money (Gas at 4s. 6d. per 1000 feet)—

	s.	d.
Dec. 6th to Dec 12th, the cost would be 570 at 4s. 6d.....	2	6¾
Hydro-carbon.....	0	2½
Total	2	9¼

The light being 2850 candles.
Dec. 13th to Dec. 20th (7 days) 1050 feet of gas at 4s. 6d..... 4 8¾
The light being 1050 candles.

Saving in cost, 1s. 11¼ d.—increase of light, 1800 candles.

Another experiment was made at the Westgate Station of the West Yorkshire Railway, the gas being carefully measured. Three lamps on the east side of that station were fitted with the apparatus of the Gas Carburetting Company, and three on the west side burnt in the ordinary way. The experiment lasted from August 15th, 1863, to January 4th, 1864:—

Gas burnt by 3 west lamps was.....18,200 feet
Gas burnt by 3 east lamps was..... 8,000 "

Saving in gas for 3 lamps..... 10,200

Estimated in money—Gas taken at 4s. 6d. per 1000 feet, and hydro-carbon at 2d. per lb:—

	£	s.	d.
3 west lamps would cost.....	4	1	10¾
3 east lamps would cost.....	1	19	9½
Saving on three lamps.....	2	2	1¼

Excess of light from Carburetted lights being as above, but costing nothing.

The difference between this and all prior systems of Carburetting Gas are very marked. All prior systems involved the use of costly volatile, dangerous fluids, explosive at common temperatures,—and the best of them raised the light-giving power of gas comparatively little. This requires the use of cheap, non-volatile fluids, which are not explosive at common temperatures, and cannot be set on fire even at 212° F., while the illuminating power of the gas may be increased four or five-fold, at the pleasure of the consumer.

Another characteristic feature of this process is the perfect steadiness of the light, resulting from the abundance of carbon in the flame. No other artificial light is so steady.

Summary of Advantages.—Far less consumption of gas; greatly increased light; perfect steadiness of flame; less carbonic acid; less heat.—Gas Carburetting Works, October, 1864.—*London Sanitary Review.*

* The light given by the gas, as burnt in the street lamps, was carefully determined at the photometer, and found to be equal to one candle per foot of gas.

PRACTICE WITH SUPER-HEATED STEAM.

At a meeting of the Institution of Engineers, in Scotland, Mr. James R. Napier gave an account from notes furnished by Mr. Beardmore, the engineer of the General Steam Navigation Co., of the working of about thirty vessels that have been fitted with superheating apparatus on the combined principle of Mr. Wethered of Baltimore. In some vessels there had been other alterations; but in others that had been altered only by super-heaters in the uptake there had been about 25 per cent. saving in fuel, with some increase of speed.

In one vessel that worked with salt water and had copper steam pipes, there was a corrostion of copper, and adeposit of it on the slide-valves, and considerable damage to engines. This was attributed by Prof. Foster, of the Andersonian University, to the presence of hydrochloric acid in the dry and hot parts of the boiler—which in that vessel had a fifth of its surface above the water level.

The Novelty Iron-works have in years past found corrosion in boilers used with surface condensers. They suspected that copper pipes had helped to cause it, and substituted cast-iron pipes; and also kept the water in the boiler slightly salt. The corrosion ceased, from which cause is not certainly known; probably the presence of copper in contact with iron does harm in many cases.

The superheaters were, on the whole, satisfactory to the company.

Ancient Mining Machinery.—An ancient mining wheel, upwards of 20ft. diameter exhited at the Academy of Arts et Metiers, at Paris, by Mr. A. Sanson, who reports that it was decovered in a Portuguese mine, and was doubtless employed by the Romans to raise water in the operation of draining the mine. It is well known that the hydraulic works of the Romans surpassed in extent any of those of modern times. As that great people had not the use of either steel or gunpowder, they were sometimes obliged to raise water over a ledge where modern engineers would carry it right through. In some of the mines of St. Domingos they make adit levels nearly three miles in length, but in some places the water was raised by wheels to carry it over the rocks that crossed the drift. Eight of these wheels have recently been discovered by the miners who are now working the same old mines. Those wheels are made of wood—the arms and felloes of pine, and the axle and its support of oak—the fabric being remarkable for the lightness of its construction. It is supposed that these wheels cannot be less than 1,450 years old, and the wood is in a perfect state of preservation, owing to its immersion in water charged with salts of copper and iron. From their position and construction these wheels are presumed to have been worked as treadmills, by men standing with naked feet upon one side. The water was raised by one wheel into a basin, from which it was elevated another stage by the second wheel, and so on for eight stages.

The Madrid Water Supply.—Formerly the water supply of Madrid was as defective as is its drainage at the present time. It is now copious, and the element is pure and excellent in quality. It is derived chiefly from the Guardarrama mountains, a range visible from the terrace of the Queen's Palace, and distant about thirty miles from Madrid. At a point called Ponton de la Olivia, and at an elevation of some 10,000 ft. above the sea level, a dam was constructed across a gorge so as to intercept one of the sources of the Manzanares.

At about two miles from Madrid an enormous reservoir was established, into which the water is conveyed by aqueducts and pipes. Thence, conducted through other pipes of large calibre, resting on blocks of granite, it flows under the streets of Madrid, in sub-ways easy of access from above, well ventilated and lighted, and is thrown, by the simple force of its own power of ascension, to the very tops of the highest houses.

John Fitch.—In Westcott's "Life of John Fitch," we find the following anecdote. The incident occurred during a visit of Mr. Fitch to Mr. Brown:

Fitch stated that he had built a vessel or vessels to give practical proof to the world of the value of his invention; that the machinery of his boat or boats required some change or amendment to satisfy the world that steamboats could and would navigate our rivers against their currents. This, his discovery, would be of peculiar and immense advantages to Mr. Brown's district, of Kentucky. He was without means or resources, and wanted about four hundred dollars, and had called upon Mr. Brown, as a member of Congress from Kentucky, to advance him that sum. Mr. Brown replied that it was not convenient—that he had not the money to spare him. Mr. Fitch, rising from his seat, said to Mr. Brown, "Well sir, if you will not advance me the money, I will go to the Secretary of State's office, and cause it to be entered, that it may remain res perpetua memoria, that I, John Fitch, inventor of steamboats, having exhausted all my means in carrying my invention into perfection, needed four hundred dollars to complete my work, and give evidence to the world of its value and utility—that I called upon you, John Brown, member of Congress from the Kentucky district, in the State of Virginia, to loan me four hundred dollars, to complete my machinery and give unanswerable evidence of the utility and importance of my invention, and that you refused it." Mr. Brown replied "You may do so, Mr. Fitch, if you please." Fitch then said, "good morning, Mr. Brown, member of Congress from Kentucky district," and Mr. Brown said, "good morning, Mr. Fitch, inventor of steamboats." Mr. Brown never saw Fitch again.

Economy in the Use of Coal.—With a view to obtain a clear bright fire with the utmost economy in a common stove, an improved fire invigorator has been introduced by a Mr. Snook, in England, and consists of an improved form of deflector, which is constructed of cast-iron, and occupies the space between the fire bars. After lighting the fire, and permitting it to burn for about four minutes, with the apparatus closed, so as to form a blower, a large concave eliptical plate, immediately over the bars, and suspended on end pivots, was tilted over to form the deflector. Above this are the necessary louvres for regulating the draught. The heat thrown out is large in comparison to the fuel burned, and the fire has a warm red glow, without flame or smoke. The advantages claimed for the invention, are—that fires are lighted without the slightest difficulty; that the whole heat from the fuel is thrown into the room instead of escaping up the chimney; that 50 per cent. less fuel is consumed; that there is no smoke, and that nothing but mere ashes are left unburned.

An exchange says that an ingenious Pennsylvanian has invented a machine for coal mining, which weighs 200 pounds, costs $300, and will do the work of twenty men. The machine operates a series of picks, which have the peculiar motion of the human arm when manipulating a pick, in undermining or bearing into the coal, and are moved up to their work by the same mechanism which operates them, and their motion and movements can be graduated to any desired speed; hence the machine can be worked by hand, horse, or steam power.

Petroleum as Salad Oil.—Every day new uses for this substance are being discovered. Its use for culinary purposes even is being discussed. We have heard of one gentleman who eats it on salad, and prefers it to olive oil!

THE MINING & PETROLEUM STANDARD AND AMERICAN GAS-LIGHT JOURNAL, is published at Tribune Buildings, No. 1 Spruce st. on the 2d and 16th of every month, and is a recognized official organ of—

LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, EDITOR AND PROPRIETOR.

W. S. SHERMAN, PUBLISHER.

PROF. C. ELTON BUCK, CONSULTING CHEMIST.

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☞ All communications to be addressed to "The Editor," No. 15 Nassau Street, New York.

AGENTS.

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The Mining and Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 2D AND 16TH OF EVERY MONTH.

JAMES W. BRYANT, ... EDITOR.

FRIDAY, DEC. 2d, 1864.

BACK NUMBERS WANTED.—We want to complete our files of the Journal, the following numbers, for which we are willing to pay full price.

Vol. II—No.'s 13, 22, 24, 25, 29 and 34.
Vol. III—No.'s 40, 42, 44, 47, 48, 52 and 56.
Vol. IV—No.'s 63, 64, 67, 68, 69, 70, 72, 74, 80, 82, 83.
Vol. V.—No.'s 91, 93, 95 and 96.

Those of our subscribers who do not bind the Journal, would do us an especial favor by forwarding to us any of the above numbers. We are being constantly called upon to furnish back issues of our paper by those who value it for future reference, and we have supplied them until all of the above numbers are exhausted.

PROF. WURTZ.—To us a man of marked individuality and extra vim is always a sight and a satisfaction. Intellect is a commodity more precious than a green-back, even of the largest denomination, whilst energy of character is a motive power superior to steam. These brief reflections came into our mind, on the entrance of the above named gentleman into our office a few days since. His residence is at No. 141 East 9th street.

THE PRESIDENT PETROLEUM COMPANY, OF PRESIDENT, VENANGO COUNTY, PENN.—The advertisement of complete organization is published on another page, and fully explains the plan of the corporation. It will be seen that the officers and directors are of excellent commercial standing and influence. Very liberal advantages are offered to subscribers, and the territory of the company is so ample that there is a very fair prospect of immense returns to the stockholders. It appears that this company has secured on the Alleghany River and favorite tributaries an oil-bearing territory of over ten and a half miles in extent. Immediately adjoining the lands of the President Company, several successful wells have been sunk, and there is strong testimony in favor of a great success for this enterprise. It is intended to form two more companies out of the territory secured by the "President," which will, of course, enure to the benefit of the original stockholders. The subscribtion agents in New York, L. H. SIMPSON & Co., Ceder street, supply all information as to details that may be desired by subscribers, $100 now paid in secures $500 of the original stock.

PATENT GAS BURNERS.

The public have been imposed upon by patent gas burners, until the name even, has become an annoyance. It was our intention to have gone into a detailed account of patent gas burners, but the catalogue is too extensive for the time and space we propose devoting to the subject. Suffice it to say, that from the observations and tests which we have given to those burners which have come under our particular notice, that we find those made by Johnson, Gleason, Mooney & Emerson, Arnold, Wood, Mallard, Lunkenheimer, Brokseiper and Winchester, all operate well as check burners, and at their proper standard of pressure, with a good tip, there is really not much difference in their respective value. The plan of feeding the gas by a check of a less size than the tip of the burner, to wit—a four foot check for a five or six foot tip, or a five foot check for a seven or eight foot tip, works admirably when there is extra pressure, as it gives an opportunity for the complete combustion of ALL the gas which passes through the check. This plan is very fully exemplified in the Winchester burner with lava tip, which, when arranged at its proper pressure standard, makes the incandescence complete, and the illumination rich and soft.

There is a brass cap (to put upon burners,) patented by Geo. C. Roundey, with wool stuffing in a small globe, which works admirably to increase the quantity of light in two or three feet burners. It is upon the same principle as above stated, but does not operate so fully when used with burners of over four feet. But none of these check burners regulate or control the passage of gas under different pressures, although they greatly economise, and give increased illumination under many circumstances, and at a fixed standard of pressure answer every purpose. When the pressure of gas does not exceed eight-tenths of an inch, a common clear burner, with perhaps wire gauze, gives perfect combustion and as good a form of flame as can be had—but when the pressure exceeds that point, there must be a check upon the flow of gas either by the stop-cock, or by having something in the burner to effect the same object. To carry out this latter proposition, there has been probably two hundred different designs and almost as many patented. Screws, discs with holes, little perforated caps, springs, balls, and every variety of stuffing, from wire gauze to wool, but none satisfactory. The latest and best mode has been adopted by some of our leading gas burner manufacturers, which is to have, as before mentioned, a smaller space for the passage of the gas from the feed pipe to the burner, than the space for its emission through the tip of the burner. Various kinds of tips are used as opinion, taste, or prejudice dictates to the parties. The lava, or steatite tip, with most persons stands pre-eminent for its full flame, especially the bat's wing, and because it does not corrode in any situation—but unless well checked, it is very extravagant in consumption or waste.

The fish tail tip of brass, gives a more full and complete flame than any other, the angle at which the holes are drilled, throw out a better form of flame than the fish tails of either lava or iron. The scotch tip, has been and is yet a great favorite, but from our tests they do not give so much light as brass tips, with the same quantity of gas.

The invention of G. W. Thompson, which has been patented, for controlling the emission of gas through the burners at different pressures, is a very valuable one, and answering the requisitions of giving a good and regular light, and positively economing whereever the pressure exceeds one inch. For streets more especially is this controller applicable, because the variations of pressure cannot be controlled by the stop cocks, as in private houses. This controller has lately had some material changes in its mechanism, and is now quite perfect in its operations. Where the pressure is low there is no necessity for any controller, but when it is over one inch—and in some places it is as high as five inches—the economy of using Thompson's controller is from 25 to 50 per cent. We shall give this subject further consideration in our next number.

NEW SCHOOL OF "MINES" OF COLUMBIA COLLEGE.

We are much rejoiced to see that a suggestion of ours sometime since, has been adopted, and that a School of Mines has been inaugurated at the above mentioned institution of learning. We believe, also, that there has been another one organized in one of the Colleges in Connecticut. We are satisfied that the great and lasting benefits that will be derived from this movement, will cause a School of Mines to be introduced into every College in our land.

Columbia College has taken the lead of all our learned institutions in providing means for the development of our immense mineral resources. Yesterday a school of "Mines" was inaugurated, which promises to be of the greatest importance to the future prosperity of the country. A few of the professors feeling the want of a school in which the practical knowledge of those branches of science which relate to mining and working to advantage the hidden mineral treasures which lie buried beneath the broad extent of our dominions, and which, up to the present time, have only been partially developed, concluded that the establishment of such a branch of education in connection with the college, would be a great desideratum. The course of instruction adopted for the government of the school, is as follows:—

First year—Descriptive Geometry and Graphies, General Chemistry, Rational Mechanics and Mining. Surveying, Mathematics, Analytical Geometry, Differential and Integral Calculus.

Second year—Mineralogy and Metallurgy, Mining Engineering, Analytical Chemistry, Botany and Geology.

The third year will be devoted to the completion of these studies, and during the recesses the students will visit, with one of the professors, the different machine shops and metallurgical establishments of the city and its environs, and will be required to write a report, which will be counted as equal to two weekly examinations in the account of their standing.

The degree of Mining Engineer and Bachelor of Philosophy will be conferred on those students who pass satisfactory examinations on either of the complete courses. Certificates of proficiency will be given to those who pass satisfactory examinations in any one branch. A special examination will be held for candidates for the degree of Doctor of Philosophy.

The following are the names of the professors under whose charge the school has been placed:—F. A. P. Barnard, D. D. L. L. D., President, Columbia College; Thomas Egleston, Jr., A. M., No. 10 Fifth avenue, Professor of Mineralogy and Metallurgy; Francis L. Vinton, No. 5 Grace court, Brooklyn Heights, Professor of Mining Engineering; Charles F. Chandler, Ph. D., Columbia College, Professor of Analytical Chemistry; John Torrey, M. D L. L. D., Columbia College, Organic Chemistry; Charles A. Joy, Ph. D., Columbia College, Lecturer on Geology; W. G. Peck, L. L. D., Columbia College, Lecturer on Mechanics and Mining Surveying; Ogden N. Rood, A. M., Columbia College, Lecturer on Physics; John H. Van Amringe, A. M., Columbia College, Lecturer on Mathematics.

THE NEW HYDRO-CARBON LIGHT.

We publish in another portion of our paper, under its appropriate head, a description of an experiment with Bowditch's patent apparatus for producing this light, and it appears to us that there are serious objections to this plan. The presence of a metallic box above the gas flame is unsightly, and would interfere with the employment of gas in many situations. Again, there is necessarily a considerable amount of risk in suspending a vessel of inflammable liquid over a flame, where there can be no security as to the amount of heat given out; and where the apparatus must, of necessity, be the very reverse of self-regulating; for when the gas is turned on somewhat stronger than usual, there is greater heat and more vapor is generated; this, in its turn, would produce a larger flame, and so on until the carburetter becomes heated to a dangerous degree. And again, in cases of leakage or accidental fracture, which are always liable to occur, there must be very great danger. As to the economy and saving of the plan, and that double the light can be produced with half the consumption of gas, we have only to say, that figures can be made to prove anything.

GAS METERS.—We call the attention of Gas Engineers and Gas Companies to the advertisement in our Journal, of Messrs. Harris & Brother, practical Gas Meter Manufacturers, 1117 Cherry street, Philadelphia. From the testimonials they have, we feel justified in recommending them as skilful workmen of long experience, and among the first in the meter business in the United States. They have a reputation for making a reliable, accurate, and durable meter of the best material and workmanship, and the character of the firm for integrity, is such as to guarantee a faithful performance of their engagements.

VALUE OF A PATENT.—The London Oil Trade Review says that the patent right taken out by Mr. James Young, the discoverer and first manufacturer of paraffin oils in commercial quantities, expires during the present month. All the manufacturing trades in Great Britain have been looking forward with great interest to the time when Mr. Young's patent shall be void, as there is very little probability if any, that a renewal of it will be obtained. Great preparations have therefore been made during the past twelve months for the erection of works in all suitable parts of the kingdom, to be devoted to the manufacture of paraffin. An enormous amount of capital has thus been invested.

TO ADVERTISERS.—Our paper offers a superior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c. &c., not so much on account of a wide-spread circulation, as from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look hrough our columns for information where to procure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

PETROLEUM REVIEW—DECEMBER, 1st, 1864.

NEW YORK, Dec. 1st, 1864.

CRUDE. Has been firm and rising since my last with but a small stock and small arrivals. Prices at, the close are 40° and 47° gravity, 46½ to 47 cts. 40° and 45° gravity, 47½ and 48 cts. I notice sales of 2000 bls. 40° and 47° gravity at 47½; ditto all the month 49 cts.—1,500 bls. 40° and 45° gravity 48 cts. also a lot Lubricating Franklin Oil at 65 cts. for 28° gravity. Crude at the wells is selling at $10 to $10 50.

REFINED. In bond has been firm, and for the past few days rising. I notice sales of 1,500 bls. prime white 70 cts—2,200 bls. standard white 69 cts. 1,000 bls. light straw to white 68 cts, also a lot of light straw oil at 67 cts. Free oil, in sympathy with bonded and the rise in gold, has also been firm. Lots were sold on exchange at 87 to 89 cts. I notice sales of 950 bls. prime light straw to white 88½ cts.—also sales of prime white (standard brands) at 90 cts. There is considerable less test oil offering at prices ranging from 84 to 87 cts. Free oil in tins is selling at 105 to 107½, Bonded 85 to 87½ cts.

NAPTHA. Is dull with but little demand.

REMARKS. The stock of petroleum has not been so light in our market, at any time, for the past three years. The arrivals are also light. The western market is using a great deal of oil—and this demand, together with the Pitsburg order, has reduced our supply greatly.

The arrivals for the week are 6 120 bls. The exports for the week 280,350 gals. and since January 20,489,250 gals.

B. L. HARSELL.

Commission Merchant,

132 and 134 Maiden Lane, N. Y.

NEW YORK MINING EXCHANGE.

NEW YORK, Dec. 1st 1864.

	Bid.	Asked		Bid.	Asked
Copper Stocks.			***Gold Stocks.***		
Aztec	7⅝	9	Benton	1	1⅛
Bedford	1	1⅛	Consol'd Gregory	25	28⅞
Boston	4⅛	5¼	Corydon	—	3
Caledonia, A. P.	10	12	Gunnel	3¾	4⅛
Canada	3¾	4	Great Western	—	8
Carp Lake	3	5	Hope	—	9
Central	65	70	Isaac's Harbor	¾	⅞
Columbian	—	24	Manhattan	—	9
Copper Falls	84½	88	Mariposa	44	44¼
Clifton	—	81	Montana	½	1
Dacotah	—	5½	New York	2½	3
Derby	⅞	1½	N. Y. & Nova Scotia	⅝	1¼
Douglass	—	—	Quartz Hill	9¼	10
Evergreen	18¼	20	Quicksilver M'g Co	81	82
Flint Steel River	12	13½	Rocky Mountain	—	10½
Frue	2¼	5	Smith & Parmelee	7	12
Grand Portage	—	—			
Hancock	12¾	14	***Coal Stocks.***		
Hamilton	—	6	American	98	100
Hilton	5	6	Ashburton	—	25
Hudson	1	2	Central	62	65
Huron	32	33	Cumberland	61	62
Indiana	8¼	9½	Del. & Hud. Canal	206	208
Isle Royale	20	20½	*Hampshire & Balt.	104	110
Keweenaw	—	6	Pennsylvania	213	215
Knowlton	7	10			
Lafayette	1	2	***Lead Stocks.***		
Manhattan	—	—	Bucks County	⅝	⅞
Mendota	—	—	Clute	1⅛	1⅞
Merrimac	4¼	5½	Erie	—	20
Minnesota	33	37	Macomb	3¼	5
New York, A. P.	2	3½	Plancentia Bay	1½	1¾
N. J. Consolidated	4	4¼	Sussex	¾	⅞
Norwich	—	6	Wallkill	2½	6
Ogima	5	6½			
Ontonagon	3	4⅛	***Iron Stocks.***		
Penn	—	11½	Copake	8	10
Providence	1¼	2	French Creek	⅝	1
Quincy	96¾	98	Teal Lake	4½	6
Reliance	1⅛	2¼			
Rockland	12¾	14	***Miscellaneous.***		
Superior	8⅞	9	Rutland Marble	17	20
Sharon Consolidated	—	3	* *Ex. div.*		

ADVERTISEMENTS.

THE PRESIDENT

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VENANGO COUNTY, PENN.

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Secretary, J. EDWIN CONANT, Esq., New York.
JOHN M. CLAPP, Esq., General Resident Superintendent.
Counsel, Messrs. PLATT, GERARD & BUCKLEY, New York.

DIRECTORS:

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L. H. SIMPSON, Esq., of L. H. Simpson & Co., New York,

ITS LANDS EORM ITS

CAPITAL STOCK, - - - - - $5,000,000

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20,000 SHARES, OR $100,000, RESERVED FOR WORKING CAPITAL.

Parties subscribing in this Company will receive an equal amount of Stock in two other Companies adjoining, without further charge.

The lands of these companies are located on the Alleghany River, and on Hemlock Porcupine and McCrea Creeks, making an oil boring territory of over ten and a half miles in extent.

The wells on the adjoining property, known as the "Celebrated Heldricks" wells, and "Pithole Creek" wells are famous for their immense supply of oil.

The wells on this property are being sunk with great vigor, and promise large supplies of oil.

To the capitalist and to the parties of limited means unsurpassed inducements are offered. Persons investing in this Company get $5 stock and the above BONUS for each $1 invested, without further call or assessment.

Subscription books, maps, and all other information, can be obtained at the office of the Subscription Agents,

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TO OIL COMPANIES.

An experienced Railroad Contractor desires a situation as Superintendent of an Oil Company. Has no family, and is willing to go to any section of the country, and can furnish the best references. Address,

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In Connection with all the Expresses,
No. 40 Broadway,
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Purchases to order ANY article wanted from New York, (or from Europe,) for ladies' or gentlemen's use or wear,—comfort or luxury—from a cameo to a cashmere—a seal-ring to a steam-engine.

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The Adams Express Company, appreciating the need of a capable medium connecting with the various Express Lines, through which personal and other orders for goods from this city, can be satisfactorily supplied, do recognize CARRINGTON & CO.'S GENERAL PURCHASING AGENCY as such medium for filling orders for every description of goods wanted from New York, and commend it to the attention of the public, and of our general and local agents, recommending our agents to extend to it all reasonable aid, by facilitating the distribution of its cards and circulars, and making known the advantages it affords.

ADAMS EXPRESS CO.
By W. B. DINSMORE, Prest.
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We cheerfully concur in the above recommendation of the Adams Express Company.
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Show Window and Street Lamp Reflectors,
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STOCKS, BONDS,
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Bought and Sold
ON COMMISSION.
D. LA FARGE, G. I. GERRARD

S. FULTON & CO., (Successors to Colwell & Co.) Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, also Heavy and Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.
SAMUEL FULTON, THEO. TREWENDT.

The Greatest Improvement yet in the Sewing Machine Art!

A CURIOSITY WORTH SEEING!

Please send for circular with sample of sewing.

These Improved Machines SAVE ONE HUNDRED PER CENT. of thread and silk, and make the LOCK-STITCH alike on both sides.

They require no instruction to operate perfectly, except "the printed directions."

No change in sewing from one kind of goods to another.

And no taking apart to clean or oil.

Our NEW MANUFACTORY is now complete, with all its machinery and tools entirely new, and is already rapidly turning out Machines which for BEAUTY and PERFECTION of FINISH are not surpassed by any manufacture in the world.

N. B.—Should any Machine prove unsatisfactory, it can be returned and money refunded.

Agents wanted in counties not canvassed by our own agents.

Finkle & Lyon S. M. Co.,
No. 598 BROADWAY, NEW YORK

PUTNAM'S CLOTHES WRINGER.
IT IS THE ONLY RELIABLE
Self-Adjusting Wringer.

No Wood-work to Swell or Split. No Thumb-screws to get out of order. Warranted with or without Cog-wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*
That a *simple* machine is better than a complicated one.
That a Wringer should be *self-adjusting, durable, and efficient.*
That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.
That wood soaked in water will *swell, shrink,* and *split.*
That wood-bearings for the shaft to run in *will wear out.*
That the Putnam Wringer, with or without cog-wheels, will *not tear the clothes.*
That cog-wheel regulators are not essential.
That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.
That all who have tried it pronounce it the *best* Wringer ever made.
That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, such there be; and we say to all, *test* Putnam Wringer. Test it *thoroughly* with *any* and *all* others, and if not entirely satisfactory, return it.

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,
JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*
JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January*, 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any*, to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.
Sample Wringers sent, express paid, on receipt of price.
Manufactured and sold, wholesale and retail, by
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13 PLATT STREET, New York,
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JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
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MANUFACTURER OF
WET & DRY GAS METERS,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

H. R. WORTHINGTON'S
PATENT WATER-METER.
This Meter combines
ACCURACY, SIMPLICITY, and
REMARKABLE DURABILITY,
with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
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MORRIS, TASKER & CO,
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PHILADELPHIA,
Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,
ARTESIAN WELL PIPES,
of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.
Gas and Steam Fitters' Tools, &c.
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MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.
Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for providing Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Line Sleves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
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POOLE & HUNT,
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are prepared to execute orders for
GAS-HOLDERS,
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And all other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

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Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms of flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 5 Park Place, New York.

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Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

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For Lighting and Heating Purposes.
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PROTECTED WROUGHT-IRON WATER & GAS PIPE.
HYDRAULIC CEMENT SEWER PIPE,
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Office, Cor. READE & CENTRE STS., New York.
Sewer Pipes extensively used in Brooklyn, and now introduced in New York, Jersey City, Newark, Hartford, Albany, and other localities, from 3 to 24 inches in calibre.
Water Pipes, lined and coated with Cement mortar, ready for laying and back filling, and can be tapped like cast-iron pipes, which they excel in durability, discharge, and economy.
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NON-FREEZING & NON-EVAPORATING FLUID,
For Filling Wet Gas-meters,
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Far Cheaper than any other Meter-fluid in use.
WARRANTED
Not to corrode tin, iron, brass, zinc, or drum-metal.
To be less injurious to wet meters that water.
Not to freeze at 20 degrees below zero, Fah.
Not to evaporate when in use in the meters, meters once filled with it requiring no further attention whatever for years.
The summer is the proper time to fill them.
SIX YEARS OF SUCCESS!
Five years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend our patent with perfect confidence.
For information and references, apply to
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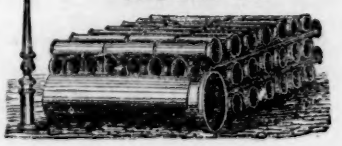

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4 Cast-iron round Purifiers, 4 feet 6 inches diamater, cast in one piece,—also grating and covers complete.

1. 4 inch Centre Seal.
1. 4 inch Condenser.
1. 12 inches by 9 feet Washer.
1. 30 inch Station Metre.

The above have been in use for some time, but are in good condition, and are now offered for sale through want of use.

For particulars apply to
P. MUNSINGER,
GAS ENGINEER.
151 South 5th Street, Philadelphia.

THE AUBIN GAS-WORKS COMPANY,
Of Albany, N. Y.,

Now contract their works to make 10,000 feet of good Gas from 2,000 pounds of *hard* wood and 40 gallons of kerosene tar, *before payment can be demanded;* and the charcoal is worth the cost of the wood.

Many Village Gas Companies can be referred to.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
205 1-2 Walnut st., Philadelphia, Pa.
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To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salesroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather o the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbert.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

PRICE OF MACHINES,
COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $65
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No. 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably Cash on delivery.

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NEW YORK FIRE-BRICK and Clay Retort Works. (Branch Works at Kreischerville, Staten Island.)

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GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND. Articles of every description made to order at the shortest notice. B. KREISCHER.

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WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.
J. D. WEST & CO.,
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SCIENTIFIC
MEDICAL PREPARATIONS
Of Prof. M. W. DICKESON, M D.,
Late Professor in the Philadelphia Med. College.

Peristaltic Persuaders.
A VEGETABLE STOMACH AND LIVER PILL.

Purely vegetable pills, prepared for the various geological formations, to neutralize all miasmatic, mineral, or other influences upon the system, and without drastic effect, which should be avoided. The best and most reliable family medicine extant, harmless under any system of diet, or exposure, acting mildly and surely, and leaving the stomach and bowels in a natural and healthy condition. To dyspeptics they are invaluable. Price 25 cents.

Imperial Cough Pills.

If you suffer from a cough it is your own fault. A trial of these pills will convince you of that fact. They decompose the phlegm, and subdue all inflammation. It is the best compound ever put together for colds, coughs, asthma, spitting of blood, and consumption. All afflicted with coughs, from whatever cause—even children with worms—can be cured by their use. Price 50 cents.

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A positive cure for any case of cholera. No matter how virulent may be the attack; also, Diarrhea or Dysentery—a sure and speedy cure. Sufferers from Chronic Diarrhea should try this established result of science. Price 50 cents.

MAGNA.
A LINIMENT CURING ALL INFLAMMATIONS.

The most extraordinary liniment ever produced or elaborated by science or experience for neuralgia, white swelling, swelling of the joints, neck, breast, arms, or elsewhere; lumbago, sore throat, erysipelas, gout, inflammation of all kinds, nervous affections, ulcers of every character; diseases of the skin, such as tetter, ring-worm, itch, &c. &c.; bites of venomous animals, stings of reptiles and insects, flesh wounds, external poisons, also burns and scaldz. Price 50 cents.

MIASCETUM.
A PURIFIER AND TONIC BITTERS COMBINED, WITHOUT ALCOHOL.

The Miascetum acts upon the stomach in such a manner as conclusively to neutralize the effects of miasmatic, malarious, and all other impure or deleterious atmospheric influences upon health. It unerringly removes the morbid condition of the stomach, imparts renewed vigor to every function of the human system, is a sure preventive of fever and ague, and all other biliary derangements, and a reliable protection against the diseases of tropical climates. Price 75 cents. N. B.—Preventive of all malignant fevers, particularly the spotted.

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(OIL OF GOLD.)

The Huile d'Or is the product of the most careful analysis and anatomy of the hair. It will remove and prevent all diseases of the scalp, strengthen the roots and increase the growth of the hair, beautifying and deepening its color; give vigor to the natural supply of coloring matter that gives tint to the hair; and, in short, can have no superior for aiding nature in giving flexibility, beauty, and strength to the prime ornament of the person.

PRICE, ONE DOLLAR PER BOTTLE.
Sold by Dealers and Druggists generally.
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SMITH & Co.

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THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works,
417 Walnut st., Philadelphia.

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COFFEE
COFFEE! COFFEE!

EAST INDIA COFFEE CO.
154 Reade St.,
(Three doors from Greenwich St.,) NEW YORK,

Call universal attention to their

Kent's East India Coffee!

KENT'S EAST INDIA COFFEE

Has all the flavor of OLD GOVERNMENT JAVA, and is but half the price; and also that

KENT'S EAST INDIA COFFEE

has twice the strength of Java, or any other Coffee whatever and wherever used by our first-class hotels and steamboats—the stewards say there is a saving of 50 per cent.

KENT'S EAST INDIA COFFEE

is the most healthy beverage known, and is very nutritious. The weak and infirm may use it at all times with impunity. The wife of the Rev. W. Eaves, local minister of the M E. Church, Jersey City, who has not been able to use any coffee for fifteen years, can use

KENT'S EAST INDIA COFFEE

three times a day without injury, it being entirely free from those properties that produce a nervous excitement.]

Dr. JAMES BOYLE, of 156 CHAMBERS ST., says: "I have never known any Coffee so healthful, nutritious, and free from all injurious qualities as

KENT'S EAST INDIA COFFEE

I advise my patients to drink it universally, even those to whom I have hitherto prohibited the use of Coffee.

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and would not be without it on any account.

The Rev. C. LARUE, an eminent clergyman of the M. E. Church, now stationed at Halsey street, Newark, says of

KENT'S EAST INDIA COFFEE,

"I have used it nearly a year in my family, and find it produces no ache of the head or nervous irritation, as in the case of all other Coffees. It is exceedingly pleasant, and I cordially recommend it to all clergymen and their families."

KENT'S EAST INDIA COFFEE

is used daily by the families of Bishop Ames, Bishop Baker, Bishop James, and many of the most distinguished clergymen and professional men in the country."

Beware of Counterfeits!

and be sure that packages are labeled

KENT'S EAST INDIA COFFEE,
154 Reade Street, New York,

as there are numerous counterfeits afloat under the name of "Genuine East India Coffee," "Original East India Coffee," etc., put forth by imposters to deceive the unwary.

In 1 lb. packages, and in boxes of 36, 60, and 100 lbs., for Grocers and large Consumers. Sold by Grocers *generally.*

Orders from Country Grocers solicited, to whom a very liberal discount will be made.

Wholesale Agents: Hoedish & Molan, and W. J. Heiss & Bro., Philadelphia; Francis H. Perry, Providence; A. L. Waite & Co., Boston; Pynchon & Lee, Springfield, Mass.; S. N. Callender, Buffalo; Gordon McMillan & Co., Cleveland; A. A. Colter & Co., Cincinnati; J. & J. W. Bunn, Springfield, Ill.; H. B Shields, Corydon, Ind.; and C. C. Garber, Chicago.

The Am. Adv. Agency, 308 Broadway, N. Y., will receive orders for the above named Coffee.

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"MAY THE BEST MAN WIN."

SAVE YOUR MONEY!

The Cheapest, most Delicious and Healthy Coffee in the World!!

LEIBIG'S ESSENTIAL
COFFEE

The most Healthy,
The most Economical,
The most delicious

PREPARATION OF COFFEE
IN THE WORLD,

OLD OR NEW.

This Coffee is prepared under a formula from the great German chemist,

PROFESSOR LEIBIG,

and gives the essential full strength and delicious flavor of OLD GOVERNMENT JAVA COFFEE, which is the only quality of Coffee used in its preparation, without any of that narcotic quality which so sadly damages the nervous system in the use of even the best grades of Coffee as ordinarily prepared.

2d. It gives the essential tonic and diuretic elements of Dandelion, without the "hereby," coarse taste so disgusting, and yet always found in the ordinary Dandelion Coffee.

It is known to all acquainted with chemistry, that the essence, or oil, or whatever name may be given it, when properly and scientifically obtained from any herb or plant, is a far different article from that produced by putting that plant into water and boiling it out—permitting the escape of the most exquisite and reliable strength and leaving the coarse and earthy drugs precipitated or in solution.

So this preparation combines the exquisite aroma of the Java Coffee, with the highest essential excellence of the most choice Dandelion—yielding the spirit without the grosser earthy body of both; thereby avoiding the deleterious effects of both and becoming at the same time

The most Delicious Beverage
AND THE
Most Health-giving and Restoring Drink

Known in the world—being at once a sovereign remedy instead of producer of

Dyspepsia and General Nervous Debility,
Flatulence, Fulness of the Head,
Dizziness, Costiveness, and
diseases of the Liver
and Kidneys,

because of its great Tonic and Diuretic qualities.

The simple fact that the preparation is from Baron Leibig, will commend it to the attention of the scientific in all parts of the country, while the use of it will at once and permanently prove to the masses everywhere that it is the long-needed desideratum—in its way.

The immense popularity of this Coffee in the Old World is an earnest that its use and popularity in America is bound to become continent wide.

Another consideration not to be overlooked in regard to the matter, is that

It Costs Less than Ordinary Green Coffee.

And requires less than half the quantity to give the same degree of strength, and its use proves it at 30 cents a pound to be cheaper than Maricaibo coffee at 15 cents a pound.

Neatly packed in pound papers, with full instructions for use on each label—in SIXTY POUND BOXES. Price, 30 cents per pound. A liberal discount to the trade.

Manufactured by the PEOPLE'S PROVISION CO., 268 Greenwich street, N. Y., to whom al orders may be addressed.

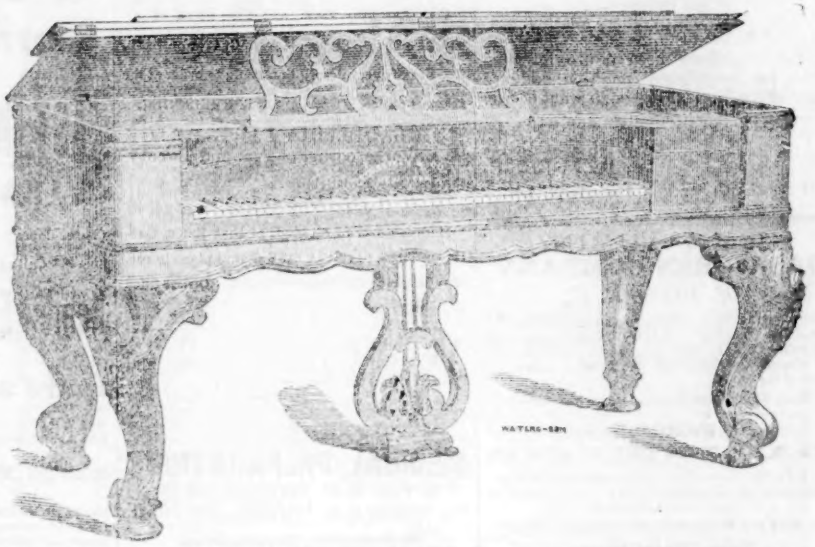
Sold by wholesale Grocers and Druggists.

GROVESTEEN & CO.,

PIANO-FORTE MANUFACTURERS,

499 BROADWAY, NEW YORK.

The attention of the public and the trade is invited to our New Scale Seven Octave Rosewood Piano-Fortes, which for volume and purity of tone are unrivalled by any hitherto offered in this marked. They contain all the modern improvements, French, grand action, harp pedal, iron frame, over-strung bass, etc., and each instrument being made under the personal supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.



THE "GROVESTEEN PIANO-FORTE"

Received the highest award of merit over all others at the Celebrated World's Fair!

where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvements we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES.

No. 1, Seven Octave, round corners, Rosewood Plain Case, $275.
No. 2, Seven Octave, round corners, Rosewood Heavy Moulding, $300.
No 3, Seven Octave, round corners, Rosewood Louis XIV, style, $325, a fac-simile of the accompaning cut.

TERMS—NET CASH, IN CURRENT FUNDS. Descriptive Circular sent free.

WEST'S IMPROVED PUMP.

Anti-Freezing, Double-Acting, Forcing, and Lifting.

These Pumps have now been in general use a number of years, and give better satisfaction than any other, and are recommended as

THE BEST!

by CAPTAIN ERICSSON and other eminent engineers. We can refer to thousands using them, and guarantee that all will recommend them. They are more simple in construction, and work easier and cost less than all others.

"Our readers will find the double acting, improved pump of J. D. West & Co., one of the best in the market. It is very simple, works to a charm, so that any child may use it; throws a steady continuous stream, and does not freeze in the coldest exposures, and is unusually cheap. We say this knowingly, and give the testimony of our own accord, without the knowledge or request of the proprietors."—*New York Evening Post, July 1st*, 1863.

"J. D. WEST & CO.: We are pleased to state that the Pumps we had of you about a year ago, have been in constant use, twelve hours each day, and raise for the use of our woolen factory, about 130 gallons per minute. They work with but little power, compared with pumps we have used before, and do not get out of repair, and are satisfactory in all respects.

"DUNLAP MANUFACTURING CO."

Solon Robinson to the Farmers' Club.

Jan. 23.

"No farmer who owns a well or cistern can possibly afford to be without an iron pump. It should be at once a suction and force pump—a perfect little fire engine—such a one known as 'West's Improved Pump.' I speak of this Pump because I happen to know it....to be very simple, durable, powerful and cheap, and it don't freeze up, nor get out of order once a year....I know this, and think I may be doing the farmers good by speaking of it....A boy ten years old can work it, and throw a continuous inch-and-a-quarter stream....It can be made to work in deep wells as well as in shallow ones."

"GREAT NECK, L. I., 1860.

"I have used this Pump for one summer and winter, exposed to the northwest wind coming over Long Island Sound, being the coldest possible exposure, and at no time did it freeze, nor were we unable at any time to pump water with great ease.

H. B. MC ILVAIN."

"The undersigned having to use "West's Improved Pumps," cheerfully recommend them as simple, durable, and powerful in raising and throwing water, and for their ease of action, security against frost, and low price, we believe them superior to all others.

"WARREN LELAND, Met. Hotel, N. Y.
"J. W. POMEROY, Yonkers, N. Y.
"JOHN MESEREAU, N. Y.
"DOMINICK LAWRENCE, Westchester."

From the New York Observer.

"We have had in use for months past one of West's Pumps, which has given us more satisfaction as a force and lifting pump than any we have ever used. It is one of great power, and well adapted for ship's decks, mines, factories, greenhouses, graperies, etc. *The Mining Chronicle and Railway Journal* says: 'It is recommended for its extreme simplicity of construction, great strength, and consequent durability and cheapness of repair. There is no stuffing-box—the pressure being held by a cup packing, like that upon the working-piston, working in a cylinder, fitted for the purpose within the upper air chamber—which we think a great improvement, as stuffing is so liable to be deranged and leak under strong pressure, to say nothing of the loss by friction incident thereto. It has also two air-chambers; thus the action of the valve is cushioned upon both sides by air—preventing water-hammer and vacuum-thump. The valves are very accessible and simply and cheaply repaired. They work much easier than any pump we have ever seen; the 4-inch cylinder being worked by children in wells 100 feet deep, and as they are extremely cheap, as well as simple and strong, we freely recommend them.'"

"CAMBRIDGE MINE, N. C., June 15, 1863.

"J. D. WEST & CO.—Gents: The Pump which I ordered for our mine is received, and put to work in our underlay shaft, which we are sinking. We find that one man will, with ease, lift 50 gallons per minute. We lifted in three and a half hours all the water in the shaft, which measures seven by twelve feet and thirty feet deep, and it was full when we commenced. It answers our expectations in every respect, and our workmen are highly pleased with it. It will do great service with but trifling expense for repairs.

"Yours, respectfully, BURR HIGGINS."

"This may certify, that I have been using, at my manufactory, for the last four years, 'West's Improved Pumps.' I now have in use three of said Pumps, one of which is kept constantly at work, 24 hours of each day (save Sundays), and has been running for the past two years. I pronounce them, unhesitatingly, the best Pumps that have been brought to my notice, having used many others previously. They are simple in their construction, and not easily disarranged.

"N. Y., Oct. 10, 1859. JAS. A. WEBB."

We have plenty more such certificates, but think these are enough. For Pumps, Hose, Pipe, etc., address or call upon

J. D. WEST & CO., 179 Broadway, New York.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway.

LILLIE'S

CELEBRATED

Chilled and Wrought Iron Safes,

WROUGHT IRON FIRE-PROOFS,

LOCKS AND VAULT DOORS.

These Fire-Proofs are manufactured to supply a demand for Security Against Fire, less expensive than my celebrated and superior Chilled and Wrought Iron Burglar and Fire-Proof Safes.

They furnish similar and equal security to the Safes generally manufactured in the different cities, but are SUPERIOR to them in their Fire-Proof qualities and durability, the iron being effectually protected from rust in any climate, and the Fire-proof not subject to lose its utility by age. This is an important advantage gained to the purchaser, as Safes often rust out and become worthless in two or three years.

To substantiate my position, those purchasing these Fire-Proofs are at liberty, by giving me due notice of time and place of trial, to test them by fire with any other Safe of the same size; and should they not prove superior, I will refund the money, or a new Fire-Proof, as the purchaser may decide.

LIST OF SIZES & PRICES OF WROUGHT IRON FIRE-PROOFS

Outside.				Inside.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
6	40	31	27	31	21	15	$150
5	34	21	26	24	21	14	125
4	31	27	25	22	18	13	110
3	30	24	24	21	15	12	100
2	28	22	23	20	14	12	75
1	24	19	20	17	11	10	50

Sample of Fire-Proof Safe at Office of the Am. Ad. Agency, 389 Broadway, N. Y.

PRICE LIST.

LILLIE'S CELEBRATED CHILLED & WROUGHT IRON SAFES.

BANK, FIRE, AND BURGLAR SAFES.
Folding Doors, D Lock.

OUTSIDE.				INSIDE.			
No.	Height.	Width.	Depth.	Height.	Width.	Length.	Price.
	In.	In.	In.	In.	In.	In.	
1	66	50	29	54½	39	18	$950
1½	59	50	26	48	39	15	800
2	53	44	27	42½	33	15	600

MERCANTILE F AND B SAFES.
Folding Doors and Monitor Locks.

3	50	42	27	40	32	16	$500
4	46	42	27	36	32	16	450
4½	38	46	27	28	36	16	450
5	42	38	27	31½	27½	15	350

Single Doors and M. Lock.

6	38	30	26	27½	23¼	15	$250
7	34	31	26	24	24	14	200
8	31	28	24	21	18	13	175
9	30	24	24	21	15	12	140
10	26	22	22	19½	13½	12	120
11	24	20	18	17	17	10	100

HOUSE SAFES

SIDE BOARD		$600
DINING ROOM		350
PANTRY (No. 1)		275
PANTRY (No 2)		150
DUODECAGON BANK LOCK		100
MONITOR SAFE	do.	50
SAFE	do.	10

NATIONAL BANK SAFES,
With 2 Inside Burglars and 1 D and 2 M Locks.

OUTSIDE.				INSIDE.			
No.	Height.	Width.	Depth.	Height	Width.	Depth.	Price.
	In.	In.	In.	In.	In.	In.	
1	68	53	35	55	39	18	$1,200
2	61	53	35	48	39	18	1,050
3	57	47	35	42½	33	18	900

BANK VAULT BURGLAR SAFES,
With Folding Doors and D Lock.

0	68	53	27	64	48	20	$1,000
0½	61	58	27	55	46	20	800
1	57	47	27	49	40	20	600

BANK VAULT BURGLAR SAFES,
Single Doors and D Lock.

2	53	32	26	49	28	19	400
3	42	36	22	38	32	18	
4	36	31	20	32	27	16	320
5	30	24	18	26	20	14	270

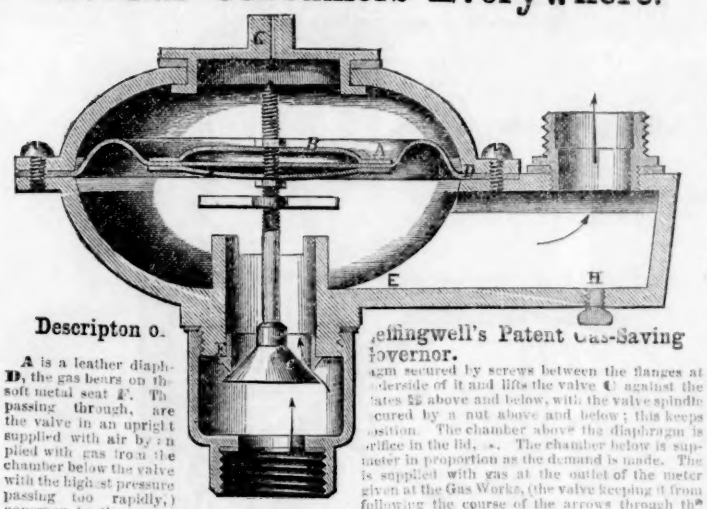
BANK VAULT DOORS AND FRAMES,
D and S Lock.

No.	Height clear.	Width clear.	Depth adjustable.	Price.	Weight.
	In.	In.	In.		
1	72	27	20	$400	3,000
2	72	27	20	275	1,500

Orders received and filled at net cash prices, by the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York. All Safes shipped from Troy free of cartage.

Business Depart., E. ALVORD. *Corresponding Depart.*, FOWLER AND WELLS.

To Gas Consumers Everywhere.



Descripton o. ,effingwell's Patent Gas-Saving Governor.

A is a leather diaph- agm secured by screws between the flanges at D, the gas bears on th- derside of it and lifts the valve C against the soft metal seat F. Th- tates E above and below, with the valve spindle passing through, are cured by a nut above and below; this keeps the valve in an upright osition. The chamber above the diaphragm is supplied with air by a rifice in the lid, a. The chamber below is supplied with gas from the plied with gas at the outlet of the meter chamber below the valve given at the Gas Works, (the valve keeping it from with the highest pressure following the course of the arrows through the passing too rapidly,) where the d stribution p ipe is connected. E. is a chamber to catch the governor to the outlet said chamber, at which point, if the drip troubles its action, a syphon it rip. H is the outlet of ttached which carries i t off.

STURGES & FROST, (MANUFACTURERS AND PROPRIETORS FOR THE UNITED STATES OF LEFFINGWELL'S PATENT GAS-SAVING GOVERNOR,) solicit attention to the above instrumen which the cut represents. It will positively lessen your gas consumption **15 to 40 per cent** without diminishing, but greatly improving, the light, which is done entirely on scientific principles easily comprehended.

The above facts are demonstrated by thousands of consumers who have them in practical operation in different parts of the Union. By sending two three cent postage stamps to the proprietors, No. 9 Mechanic Street, Newark, N. J., the GAS CONSUMERS MANUAL will be sent, containing price of the above Governor, full information with regard to the waste of gas, its causes and how remedied, an almanac for the years of 1864-5-6 and 7; also, a diary suitable for any year, together with certificates and references of many who have the Governors in use.

Try it by all means, it will not fail you.

Each Governor is Warranted Perfect.

STURGES & FROST.

☞ As no QUICKSILVER is used, Gas Companies will find it to their interest to favor its adoption among their consumers.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings, prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

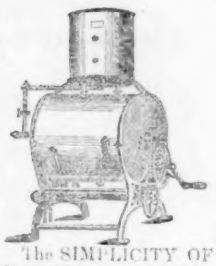
A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agents—S. R. WILLIAMS, 204 South Front st., Philadelphia.
CALVIN GAY, 29 Doane st., Boston.

DRAKE'S
PATENT
AUTOMATIC GAS MACHINE.



THIS MACHINE, which has been in constant use for more than two years, is now acknowledged to be the

Most Convenient,
Simple, and
Efficient Method

OF LIGHTING BUILDINGS OF ALL KINDS, out of the reach of regular gas works, ever brought to public notice.

The SIMPLICITY OF THE APPARATUS, its ENTIRE FREEDOM FROM DANGER, the LITTLE ATTENTION REQUIRED, the EASE WITH WHICH IT IS MANAGED, and THE CHEAPNESS and SUPERIORITY OF THE LIGHT, has gained for it the favorable opinion of those acquainted with its merits.

The Machine takes up but little room; no disagreeable odor is experienced in its use; no fire is applied to the apparatus at all; it can be attached to ordinary gas-pipes used for coal-gas, and is burned through the same kind of fixtures.

These Machines are manufactured in Boston, by the AUTOMATIC GAS-MACHINE CO., and are for sale at their Store, 78 Washington Street, Boston, and also at the Agency, MITCHELL, VANCE & CO.'s, No. 620 Broadway, New York

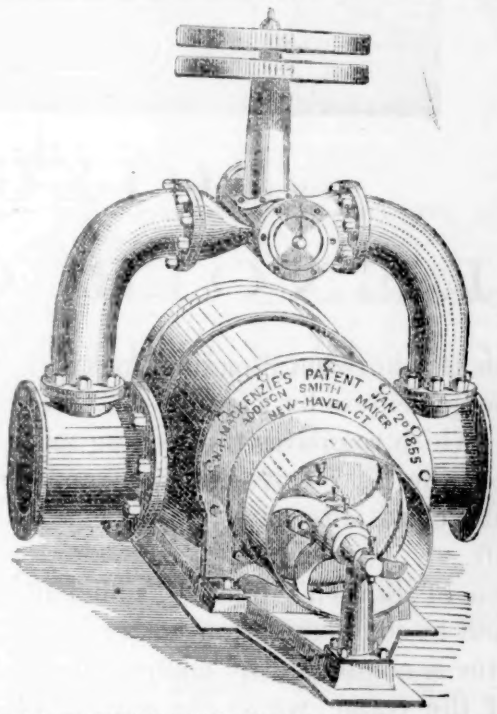
For farther particulars, address—

MITCHELL, VANCE & CO.,
620 BROADWAY, NEW YORK CITY.

SMITH & SAYRE,

Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER AND COMPENSATOR.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. uel. Address SMITH & SAYRE, 458 Broadway, New York.

THE
STANDARD Gold Company
OF COLORADO.

DIRECTORS,
ROBERT BOWNE,
EDWARD WILLIS,
LIVINGSTON SATTERLEE,
ETHAN ALLEN,
S. A. BANKS,
SYLVESTER TAYLOR.

President, ROBERT BOWNE.
Secretary, F. A. MITCHEL.

MINES on FISK LODE,
BOBTAIL LODE,
GROUND HOG LODE,
ENTERPRISE LODE,
and others,

In all, 8,625 feet (linear), and large water powers and mill sites.

Capital issued, 40 000 shares, at $10 per share.

A limited number of shares are offered at the low SUBSCRIPTION PRICE (having been reserved for their customers), by

WILLIAMS & MITCHEL, 12 Wall Street.

SAFEST AND CHEAPEST SYSTEM OF INSURANCE.

WASHINGTON
INSURANCE COMPANY,
172 BROADWAY,
Cor. Maiden Lane, NEW YORK.

CASH CAPITAL, - - -	$400.000.
Assets, June 1, 1864, - - -	600.000.
Scrip Dividend, 1863, - -	60 per Cent.
Scrip Dividend, 1862, - -	60 per Cent.
Scrip Dividend, 1861, - -	60 per Cent.

The Policies entitled to participate receive 75 per cent. of net Profits.

Insures Buildings, Merchandise, Furniture, Rents, Leases, against loss or damage by FIRE, and MARINE RISKS on LAKES, RIVERS and CANALS.

GEO. C. SATTERLEE, President.
HENRY WESTON, Vice Prest.
WM. K. LOTHROP, Secretary.
WM. A. SCOTT, Ass't Secretary.

SATTERLEE & CO.,
BANKERS
AND
STOCK BROKERS,
49 Exchange Place,
NEW YORK.

G. B. SATTERLEE, H. A. BOSTWICK, H. TRACY ARNOLD, LIVINGSTON SATTERLEE.

Mining Stocks bought and sold at the Regular, Mining, Boston and Philadelphia Boards.

ALBERT H. NICOLAY,
STOCK BROKER AND
AUCTIONEER,
No. 52 William Street,
NEAR WALL ST., NEW YORK.
Special attention given to the Buying and Selling of Gas-Light Companies' Stocks.

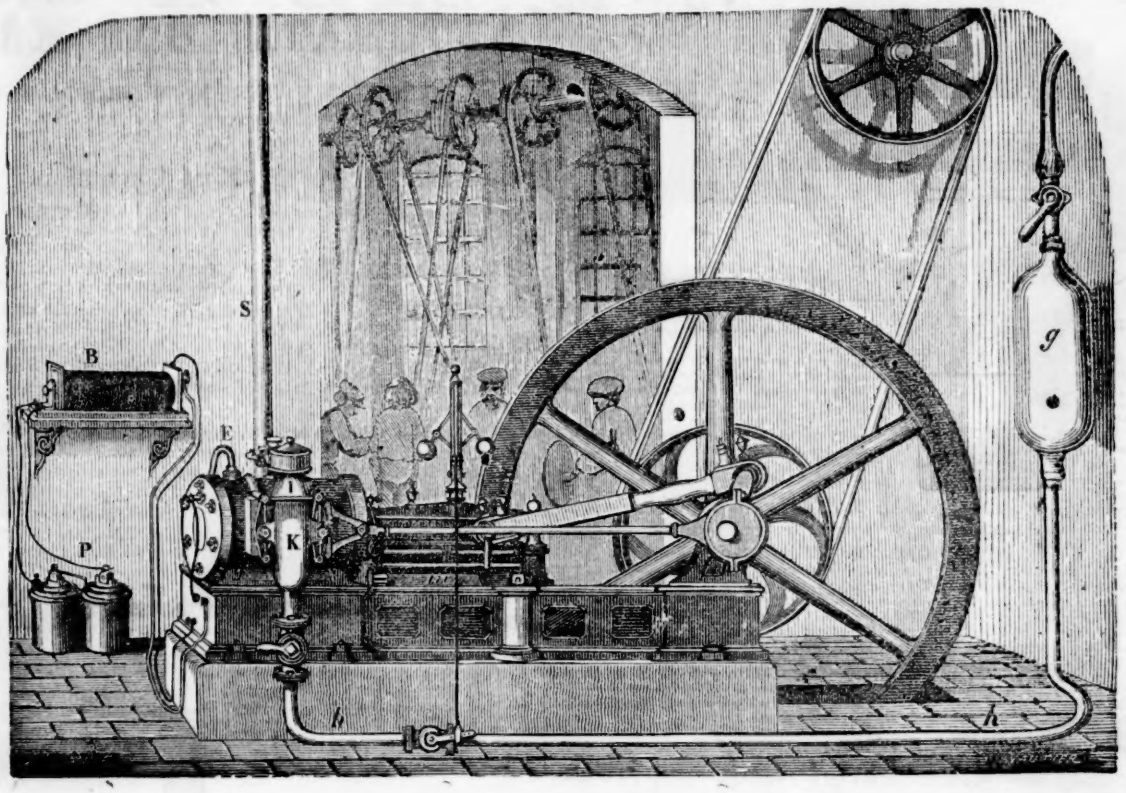
PARTICIPATION.
ÆTNA FIRE INS.
COMPANY OF NEW YORK,
No. 170 Broadway.

CASH CAPITAL,	CHARTERED
$200,000.	1824.

The insured receive seventy-five per cent. of the net profits annually, without incurring any liability. When preferred, a discount will be made in lieu of participation in profits.

Scrip Dividend of 1861, - - 50 per cent.
Scrip Dividend of 1862, - - 50 per cent.
Scrip Dividend of 1863, - - 50 per cent.

JACOB BROUWER, *President.*
H. C. BEACH, *Secretary.*
WM. H. BARBOUR, *Asst. Sec.*



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end of the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters through a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two horse and a half horse Engine are now in practical operation at the brass cock manufactory of Mr. A. Carr, *No.* 135 *Mercer St, between Prince and Houston Streets,* New York where those interested are invited to call and examine them.

THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

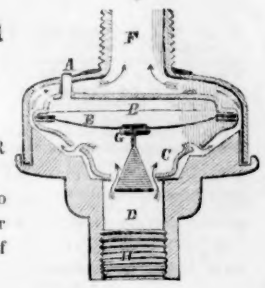
It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK.

NOTICE TO GAS COMPANIES AND GAS CONSUMERS.

THOMPSON'S PATENT GAS CONTROLLER,

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to sci nce.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of from five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to the public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME, President Manhattan Gas Company, N. Y.
C. H. SANDS, Esq., President Metropolitan Gas Company, "
J. H. ADAM, Esq., President New York Gas Company, "
PETER COOPER, Esq., Cooper Institute, "
JOHN A. DUFF, Esq., Olympic Theatre, "

GEO. H. KITCHEN, Inspector of Gas Meters, N. Y.
A. L. BOGART, Esq., Gas Engineer.
Col. J. A. SABATTON, Engineer Manhattan Gas Company.
Col. A. J. WHITE, Engineer Metropolitan Gas Company.
J. K. SIMPSON, Esq., Engineer Cooper Institute.

Persons interested are invited to call at the manufactory, 52 Greene street, where they can see the operation by pressure guage and test meters.

M. L. CALLENDAR, Agent
Office, 52 GREENE STREET.

THE AMERICAN METER CO.,

Organized under the General Manufacturing Laws of the State of New York.

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER.

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

512 WEST TWENTY-SECOND STREET, NEW YORK.
ARCH AND TWENTY-SECOND STREETS, PHILADELPHIA.
1 BARRETT STREET, BOSTON, will meet with prompt attention.

HARRIS & BROTHER,
PRACTICAL GAS METER MANUFACTURERS,

Continue, as heretofore, at their old Establishment,

No. 1117 CHERRY ST., PHILADELPHIA,

TO MANUFACTURE

WET AND DRY GAS METERS and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works.
OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicited, and promptly attended to, by—

HARRIS & BRO.
No. 1117 Cherry st., Phila.

GEO. H. KITCHEN & CO.,
NEW PATENT
GAS APPARATUS
For Country Residences, Public Buildings, &c.,
FROM $300 UPWARDS.
EVERY DESCRIPTION OF GAS FIXTURES.
Gas Fitting in all its branches.
561 Broadway,
NEW YORK.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

GLYCERIN
FOR
Filling Wet Gas-Meters,

Cheaper than Whisky or any other substance.

We have furnished the Cincinnati Gas and Coke Company 300 barrels Glycerin, for filling their wet meters, and are now ready to supply other Gas Companies at the lowest cash prices.

We warrant our Glycerin not to corrode the meter metal, nor to freeze at the lowest ordinary temperature, nor to evaporate.

HARTMAN & LAIST,
Manufacturing Chemists,
Cincinnati, O.
Office 64 Sycamore.

Agent in New York, Paul Balluff, 95 Maiden Lane

WOODEN PURIFYING TRAYS.

PATENT
Conically Slotted Solid Wood Sieves
FOR GAS PURIFIERS.

CAUTION
TO
GAS MANUFACTURERS.

The Conically Slotted Solid Wood Tray was patented 21st October, 1862, by N. O. Hawxhurst, assignee of Wm. Combe, and all persons are cautioned against purchasing such trays of R. G. Hunt, or any other person except the subscriber, as it is a direct infringement of said patent. The following companies are now using these trays.

Manhattan, New York,
Williamsburgh,
Brooklyn,
Albany,
Baltimore,
Philadelphia,
Chicago,
Louisville,
And numerous others.

Orders received by mail or otherwise
JOHN L. CHEESMAN,
247 Ave. C, New York

Glycerin for Gas Meters.

This article is superior to any fluid ever before used for Wet Meters, and we cannot better set forth its advantages than by giving the following letter from the Superintendent of the Covington Gas Co. The superiority of our Glycerin over all others in the market, for this purpose, is admitted by every Company that has used it. We have sold, the past winter, to the Cincinnati Gas-Light and Coke Co; to the Gas Companies of Covington, Ky.; Dayton, Springfield, Portsmouth, Urbana, and Piqua, Ohio Richmond, Ind., and Buffalo, N. Y, to whom we refer.

Glycerin is much cheaper than Whisky is now, or likely to be hereafter, and not evaporating, greatly increases the economy of its use.

OFFICE OF THE COVINGTON GAS-LIGHT CO.
COVINGTON, KY., Feb. 18, 1864.

MESSRS. W. J. M. GORDON & CO.:

Dear Sirs,—It affords us great pleasure in testifying to the superiority of the Glycerin Fluid purchased from you for filling the Wet Meters now in use by the Covington Gas-Light Company.

The difficulty of finding a non-evaporating and anti-freezing mixture for Wet Meters, has, in my opinion, been overcome by the use of your Glycerin Fluid.

I have had it in constant use for the past four months, and during that period the thermometer has ranged as low as 14° below zero, and after careful examination, I have found the fluid in the same condition as when first put in the Meters, and without the slightest discoloration.

Its non-evaporating quality does away with the hitherto unavoidable expense of filling the Meters monthly, and renders Wet Meters no longer objectionable.

In fact, I can cheerfully recommend it as being cheaper and better than any other Fluid or Mixture now in use.

Very respectfully,
S. S. STRATTON, *Sup't Cov. Gas Co.*

We have been engaged in Manufacturing Glycerin the past six years, and from our advantage in material and the large amount we make, are enabled, to offer it lower than any manufacturer in this country. We will be pleased to quote prices or to give further information.

W. J. M. GORDON & BRO.,
MANUFACTURING
CHEMISTS & DRUGGISTS,
N. E. Cor. Central Avenue & Eighth St.,
Laboratory, Miami Canal, bet. Third & Fifth Sts.,
CINCINNATI, O.

ATLAS
OF THE
OIL REGIONS.

The extraordinary developments of the last few years have rendered indispensable to the community, A NEW and RELIABLE map of that portion of Pennsylvania, known as the OIL REGIONS. And such a Map, in the form of an Atlas, made from actual surveys of the whole territory (and the only surveys that have been made in the territory,) is now being prepared for publication by the undersigned, to which your special attention is invited. It will embrace the whole of VENANGO and portions of CRAWFORD and WARREN Counties, and is designed to be the most complete and perfect work of the kind ever published, showing distinctly—

1 A general map of Venango and parts of Warren and Crawford counties, Penn., and enlarged plans of each township.

2 All the original lot lines.

3 All subsequent subdivisions of lots in the oil districts, with the names of present owners or lessees.

4 All the Roads, Rivers and Creeks accurately delineated.

5 All Dwellings, Factories, Mills, Refineries, and Shops of every description.

6 Enlarged plans of all important Towns and Villages.

7 Enlarged plans of all the oil lands on Alleghany River, Oil Creek, French, Pithole, Tionesta, Hemlock and Tidelute Creeks, Cherry and Cherry Tree Runs, and all other Creeks and Runs on which discoveries of oil have been made.

8 Location and brief description of the property of all the principal Oil Companies.

9 Location and names of all the Oil Wells in the Territory.

10 A brief history of the Oil Business, from its first discovery to the present time, with valuable statistical information, making a volume of some fifty pages, about 15x18 inches, substantially bound.

A limited number of business cards pertaining to the production or sale of oil, or oil territory, will be received, and if early application be made, parties may have views of their establishments, or wells, with brief notices of the same, inserted.

The surveys for the Atlas are completed, and the proprietors intend to have it ready for delivery to subscribers (only) by about the 1st of January next.

All persons or firms desiring the work are requested to send their names as subscribers to the undersigned before the 1st of December, and designate the number of copies wanted, and the place where they wish them delivered.

F. W. BEERS & CO
43 John St., New York,
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Franklin, Penn, Oct. 20, 1864.

New York, April 18th, 1864.

* * * * * *

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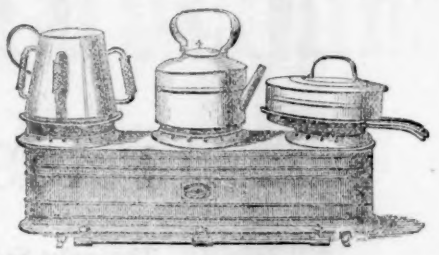

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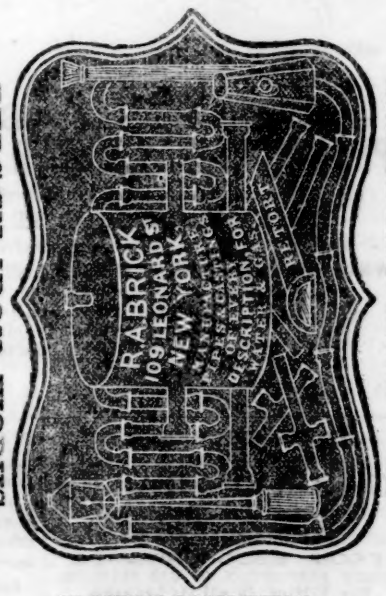

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